TECHNO GY DEPT.

POWER

POWER GENERATION, TRANSMISSION, APPLICATION
AND THE ATTENDANT SERVICES IN ALL INDUSTRIES

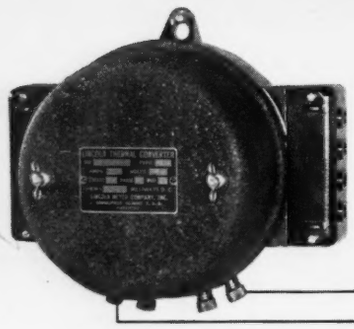
EQUIPMENT—Review of New Products — PAGE 64
Presenting over 300 descriptions of 1942's new and improved equipment, pictured and classified for quick reference

ASME—Report of Annual Meeting Sessions — PAGE 99
Digests and discussions of sessions on power plants, fuels, instruments, pumps and diesels. Also elections and awards

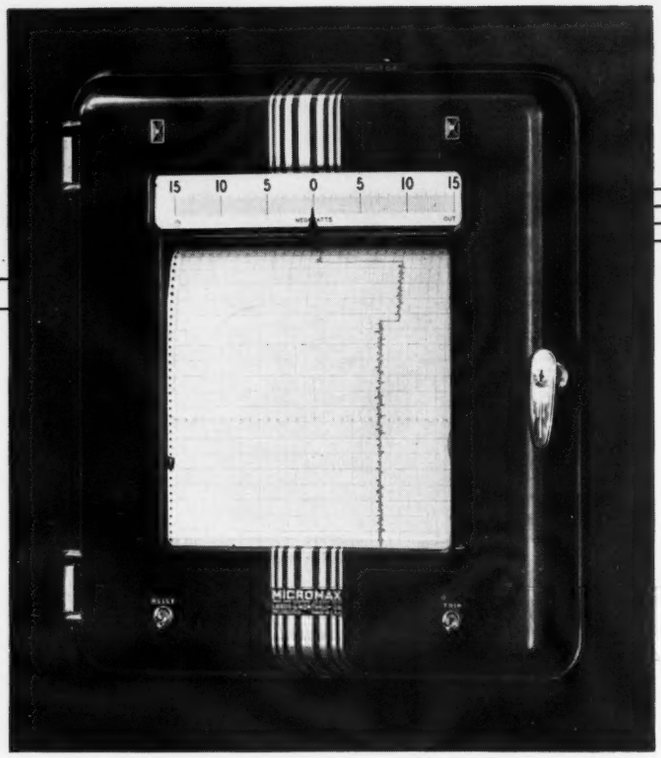
CATALOGS—Technical Literature of the Year — PAGE 120
To help you bring your technical library up to date: Reviews of more than 350 manufacturers' handbooks, bulletins and leaflets

DIRECTORY—Of Power Equipment, Supplies — PAGE 201
Your wartime guide to power equipment and makers. 7000 listings of manufacturers' names under more than 400 product headings

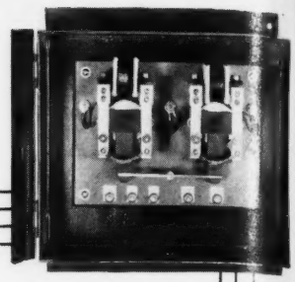
MID-DECEMBER 1942 • BUYERS' GUIDE NUMBER



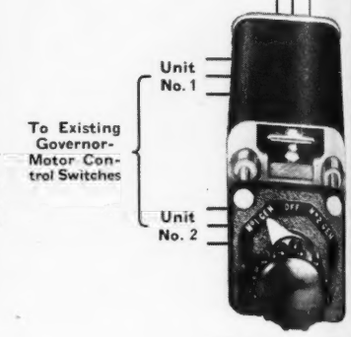
Lincoln Thermal Converter. Detects value of load and reports it to Micromax Controller.



Micromax Recording Controller for tie-line load. Measures tie-line load, and sends correcting impulses to governor-motor contactors when actual load differs from scheduled load.



Governor Motor Contactors.



Unit-Selector Switch Enables operator to assign tie-line control to any generating unit.

TIED IN WITH A UTILITY?

Here's the Tie-Line Control You'll Need

Industrial power plants which are tied in with a public-utility or other power network much larger than themselves can use the Micromax Tie-Line Load Controller to maintain, automatically, any desired interchange of load, and also to record the amount of power which changes hands. No alterations in the generator-governor are required; the Micromax Load Recorder simply operates the synchronizing motor on the governor, just as a man would do. In addition to being continuous and fully automatic, however, the mechanism detects and acts on load changes while they are still too small to show on a wattmeter, and so the Controller brings a new order of precision to the job of load-regulation.

This Controller is, mechanically, a standard Micromax, like those employed for temperature, frequency, voltage, salinity and many other conditions. Its load detector, the Lincoln Thermal Converter, is also a standard device on public-utility systems; it has no moving parts and requires no maintenance. The whole equipment can be installed by an electrician or instrument man.

If you have a tie-line load problem on which this Controller could apply, outline it and we will send further information.

Jrl Ad N-56-161(3)

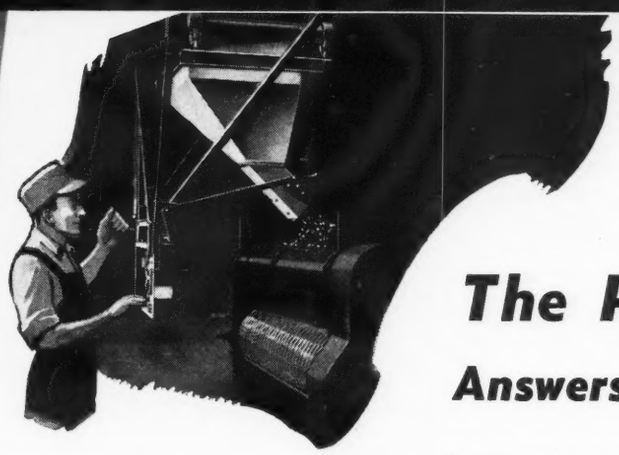
LEEDS & NORTHRUP COMPANY, 4910 STENTON AVE., PHILA., PA.

LEEDS & NORTHRUP

MEASURING INSTRUMENTS TELEMETERS AUTOMATIC CONTROLS HEAT-TREATING FURNACES

POWER (with which are consolidated "Science and Industry," "The Engineer Review," "The Engineer," and "The Stationary Engineer"), December 15, 1942, Vol. 86, No. 13. Published monthly with an additional Directory number in December. McGraw-Hill Publishing Company, Inc. Publication office, 99-129 North Broadway, Albany, N. Y. EDITORIAL AND EXECUTIVE OFFICES, 330 WEST 42ND STREET, NEW YORK, N. Y. Entered as second class matter August 25, 1936, at Post Office, at Albany, N. Y., under the act of March 3, 1879. Printed in U. S. A. Allow at least ten days for change of address. All communications about subscriptions should be addressed to the Director of Circulation, Power, 330 West 42nd Street, New York, N. Y. Subscription rates—U. S. and U. S. Possessions, $3.00 for one year, $4.00 for two years. Canada, $3.50 for one year, $5.00 for two years. Great Britain and British Possessions 36 shillings per year. All other countries $6.00 for one year, $9.00 for two years, 35c per copy.

"PRAISE THE LORD and (WE'LL) PASS THE AMMUNITION!"



The PRODUCTIONEER*

Answers the Call of Freedom!

★ The War isn't going to be won on the *production* line—it's going to be won on the *firing* line. Yet it cannot be won without the gigantic effort of American Productioneers—without the constantly-increasing flow of materiel, ammunition, and fighting equipment produced by American Industry.

★ Today the battle cry of freedom is resounding throughout mines, foundries, factories, mills and shipyards all over the Nation—sounding its call amidst the whir of busy machines, and the activity of its Productioneers.

★ Yes, American Productioneers are on the job day and night—passing the "ammunition" to the boys at the front, who know how to make the most of it!

*You are welcome to use the word "Productioneer" as applied to the war-worker in your plant, shop or factory, if you so desire.

LINK-BELT PRODUCTIONEER

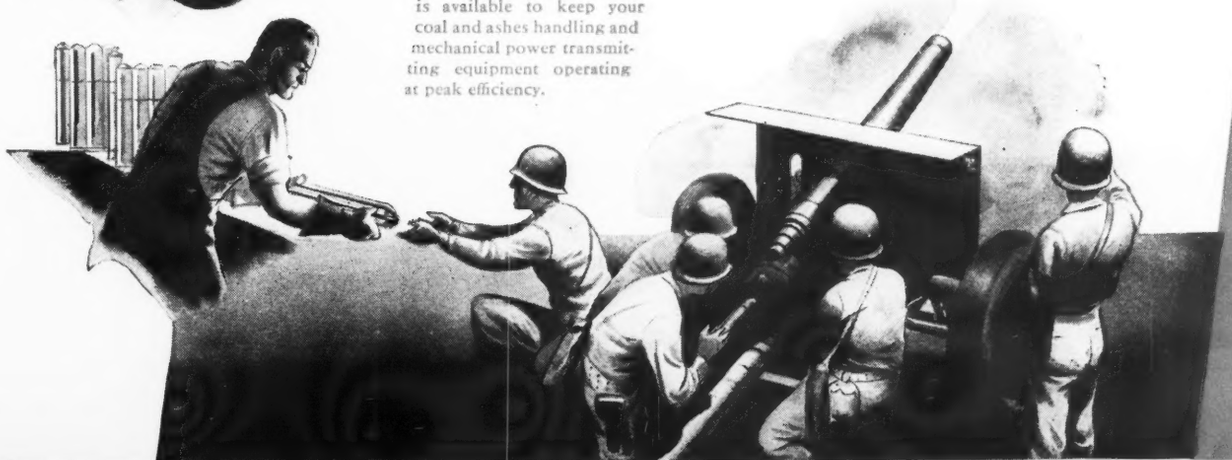
LINK-BELT COMPANY

Chicago, Indianapolis, Philadelphia, Atlanta, Dallas, San Francisco, Toronto. Offices and Warehouses in Principal Cities

8978-D

Link-Belt Maintenance Parts Service

is available to keep your coal and ashes handling and mechanical power transmitting equipment operating at peak efficiency.



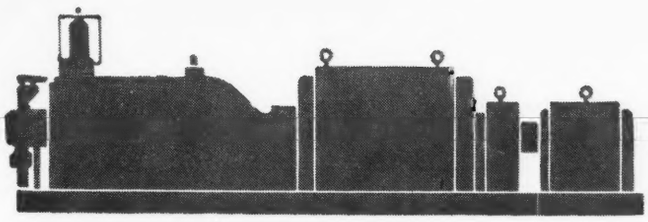
Cross-hairs centered on the AXIS

The products of Elliott Company are aimed directly at the enemy. They are essential preliminaries to the speedy production of high explosives, oil, gasoline, synthetic rubber, magnesium, aluminum, and a host of equally vital products. They are also used directly in the power plants of combatant and non-combatant ships of the Navy and the merchant marine, as well as in the plants supplying power for war production. They are driving the wheels of America to victory.

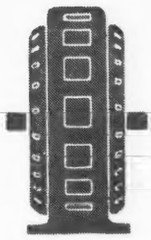
In promoting the better use of these products, Elliott Company offers the services of its large engineering staff. These men and services are at your call and anxious to contribute an even greater share in the war effort. Let us work with you.

Fully descriptive bulletin on any of the above products, available at request.

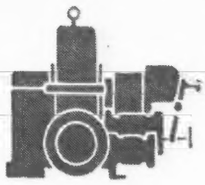
ELLIO



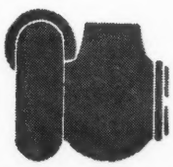
TURBINE GENERATORS



GENERATORS

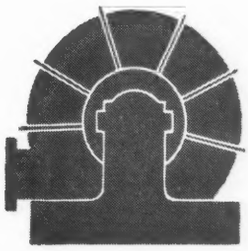


MECHANICAL DRIVE TURBINES

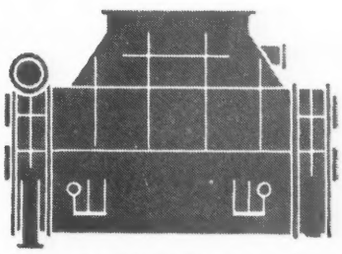


TURBOCHARGERS *for* DIESEL ENGINES

MOTORS

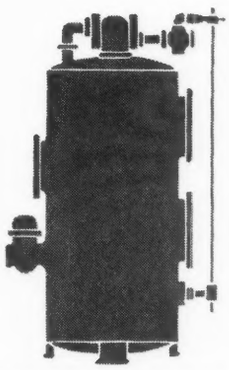


CENTRIFUGAL BLOWERS



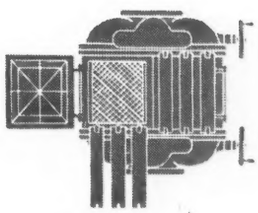
CONDENSERS

DESUPERHEATERS



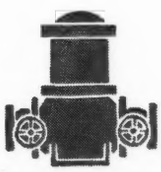
FEEDWATER HEATERS *and* DEAERATORS

STEAM JET EJECTORS



STRAINERS

TUBE CLEANERS



FILTERS

NON-RETURN VALVES

SEPARATORS

TT COMPANY

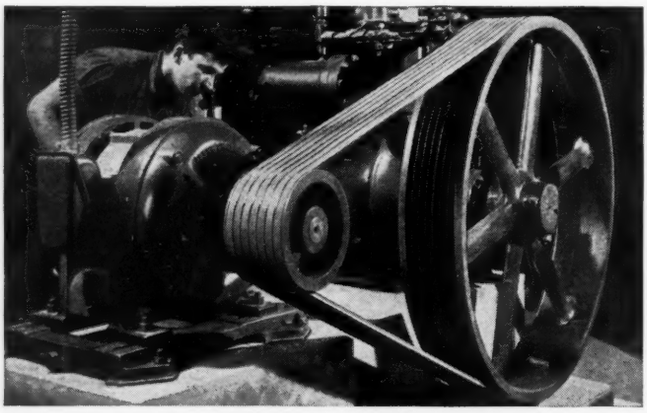
JEANNETTE, PA. • RIDGWAY, PA.

SPRINGFIELD, OHIO

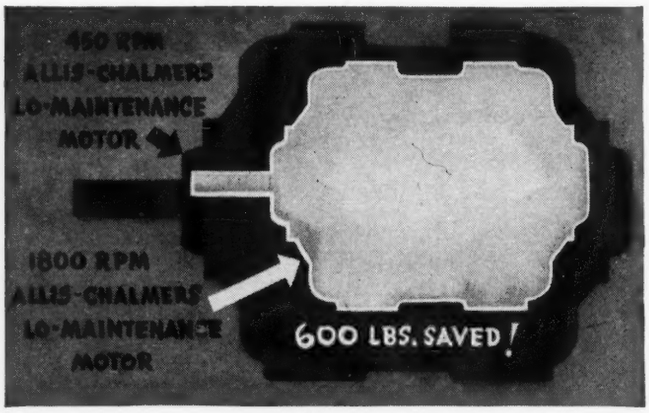
DISTRICT OFFICES IN PRINCIPAL CITIES

It's Time to Look at Motor

➔*You Can Save with High-Speed Instead of*

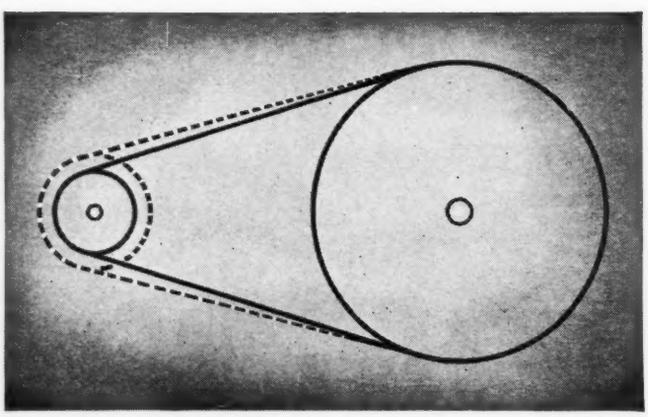


1. In most applications, an 1800 rpm motor with Texrope Drive will ably do the job of a lower-speed, direct-connected motor . . . *and* give you *exactly* the speed you want — *at lower cost!*

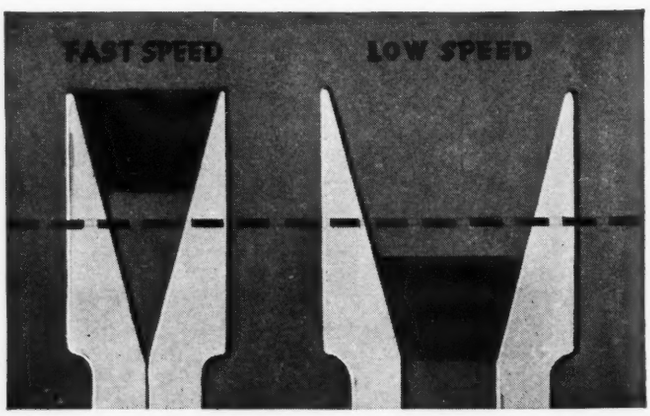


2. When you buy an 1800 rpm instead of 450 rpm 15 hp squirrel-cage motor, for example, 600 lb of critical materials are saved. And *you* save well over $200—with the drive figured in! This saving is typical.

➔*You Can Save with Single-Speed Instead of*



1. Infrequently needed speed changes can be had by changing from one size motor sheave to another. By juggling *complete* drives, speeds can be changed over the full range — from 1:1 to 7:1.

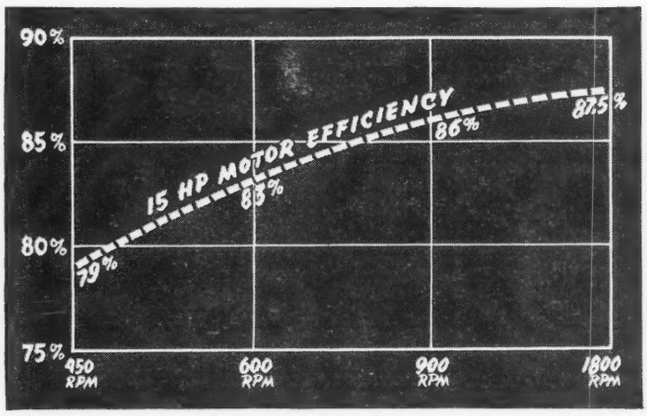


2. With the Allis-Chalmers Vari-Pitch Sheave, you can increase or decrease speed by adjusting sheave diameter, as above. Within limits, an unbroken series of speeds can be obtained.

Take a Fresh Buying!

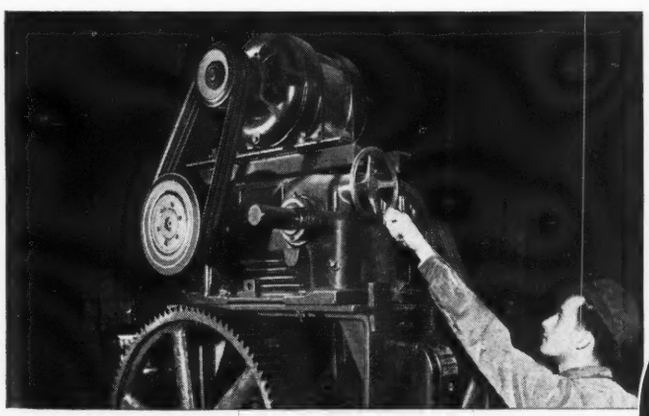
WAR FORCES HIGHER EFFICIENCIES...

Low-Speed Motors...



3. Note that efficiency rises from 79% for a 450 rpm motor to 87.5% for a 1800 rpm motor. Comparing power consumption, the 1800 rpm motor saves you over 30 kw/24 hr. day.

Multi-Speed Motors...



3. Allis-Chalmers Vari-Pitch Speed Changer gives you infinite changes at the turn of a wheel — within 3.75 to 1. It's the most compact, flexible variable-speed transmission available.

It was good business in peacetime to use — as widely as possible — high-speed motors with Allis-Chalmers Texrope Drives...and single-speed motors with Allis-Chalmers Vari-Pitch Sheaves and Speed-Changers. And it's clearer every day that those material and money-saving practices are *vital* practices in time of war!

TODAY the whole picture of buying and applying motors has changed. Note at the left how much you can save for your country *and yourself* with high and single-speed motors made flexible by Texrope Drives.

As America's only builder of both electric motors and V-belt drives,* Allis-Chalmers has long advocated the proper combining of motor and V-belt drive.

And today you benefit from Allis-Chalmers' vast, pioneering experience in this field when you ask for and get the *right* combination of Lo-Maintenance Motor and Texrope Drive! Call your nearby district office. Or write ALLIS-CHALMERS MFG. CO. MILWAUKEE, WISCONSIN.

A 1560

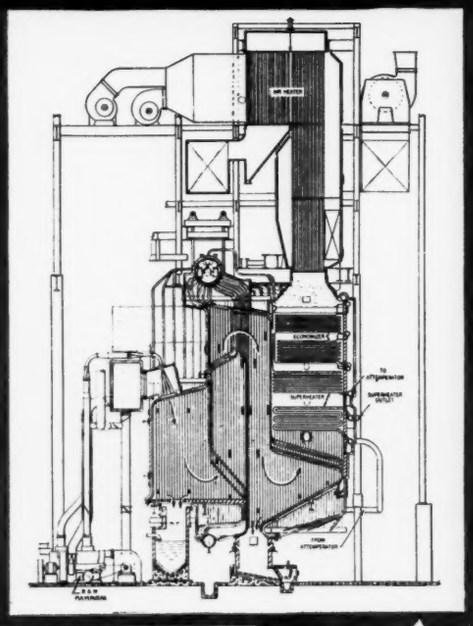
*Allis-Chalmers *originated* the Multiple V-Belt Drive and Vari-Pitch Sheaves.

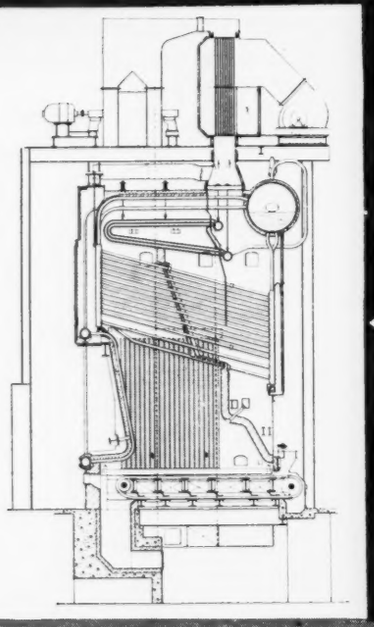
ALLIS-CHALMERS A-C MILWAUKEE

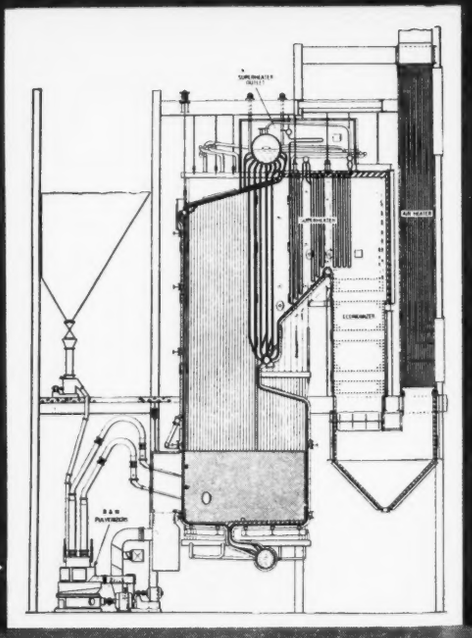
WE WORK FOR VICTORY WE PLAN FOR PEACE

B&W

STEAM-GENERATING U



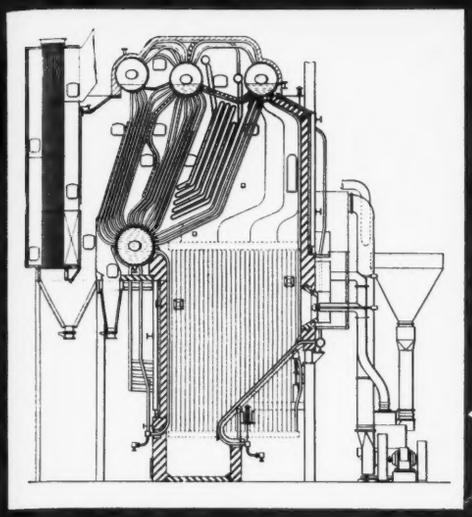


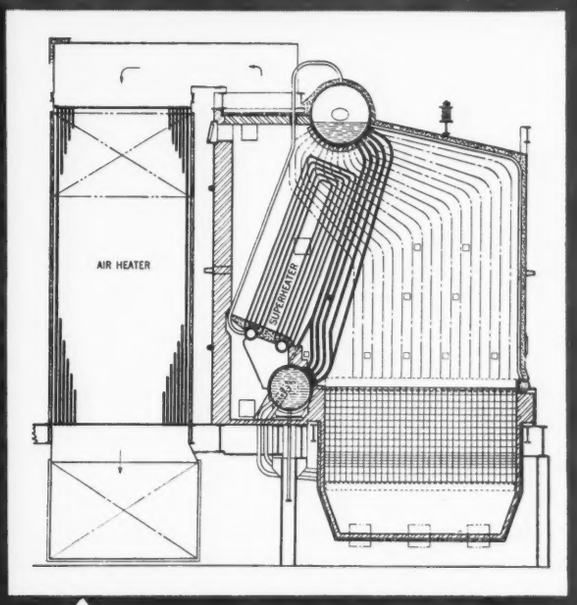


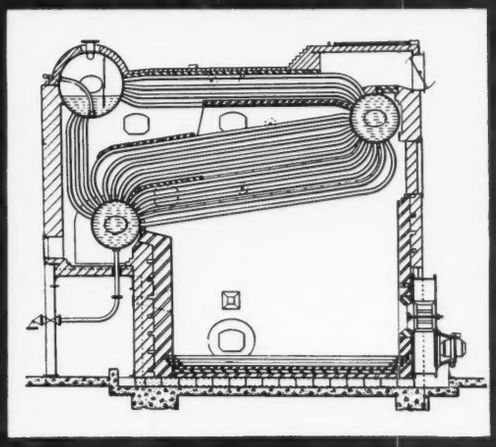
BABCOCK &

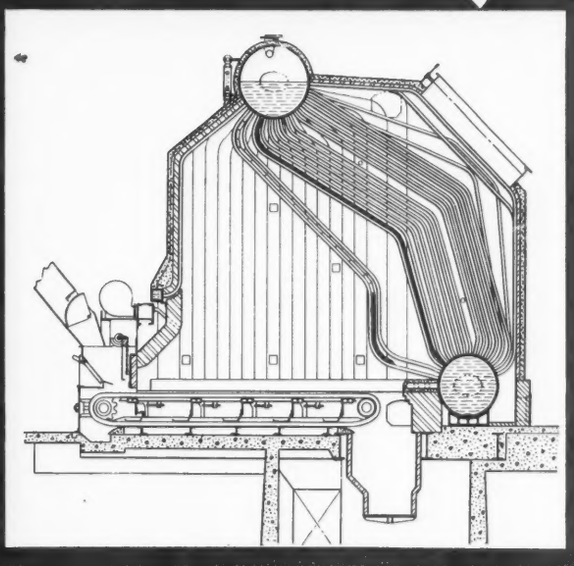
THE BABCOCK & WILCOX COMPANY

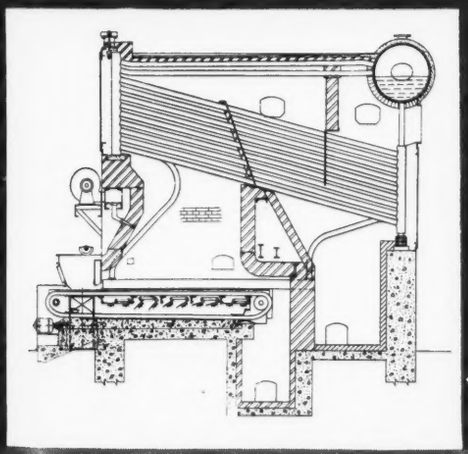
G UNITS HELP POWER THE WAR EFFORT..











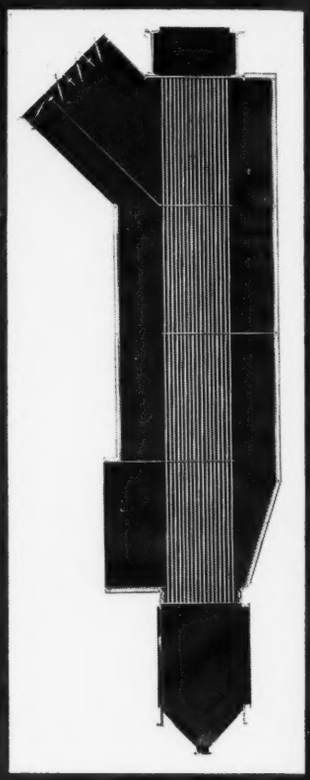
G-236 F

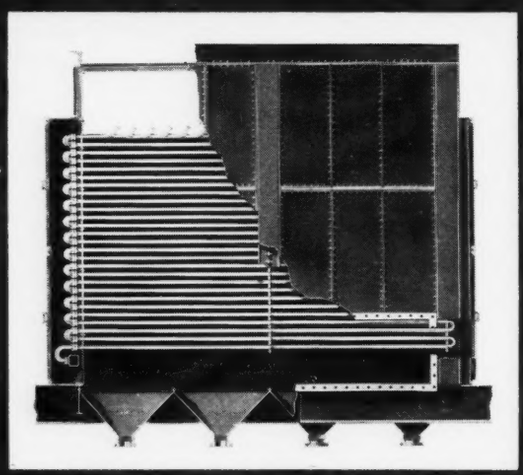
& WILCOX

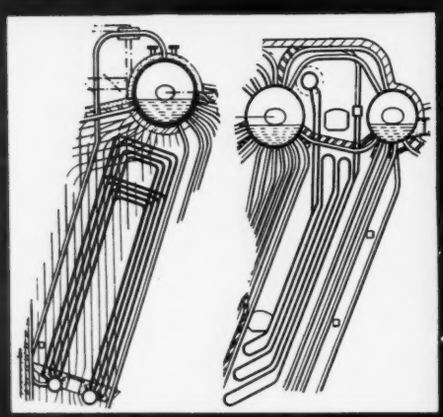
85 LIBERTY STREET, NEW YORK, N. Y.

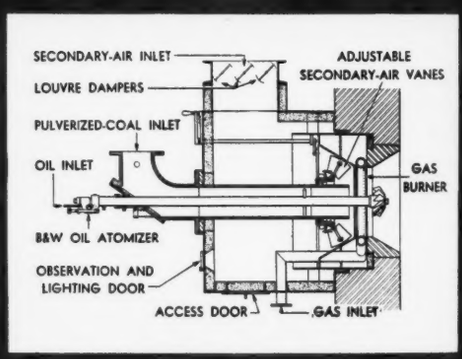
The Navy "E" Award to the Barberton Works for production achievement is "an honor not lightly bestowed and one to be cherished."

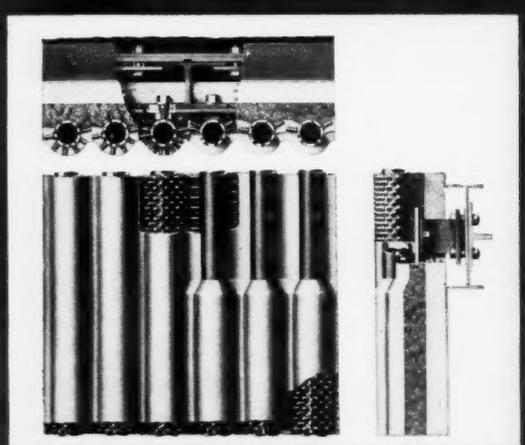
B&W EQUIPMENT PROVIDES AS











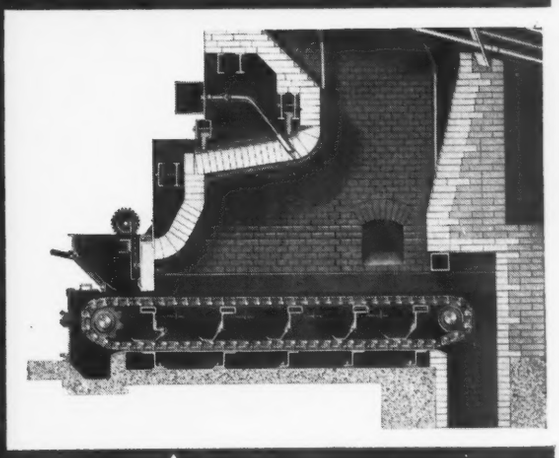
WATER-COOLED FURNACE CONSTRUCTIONS

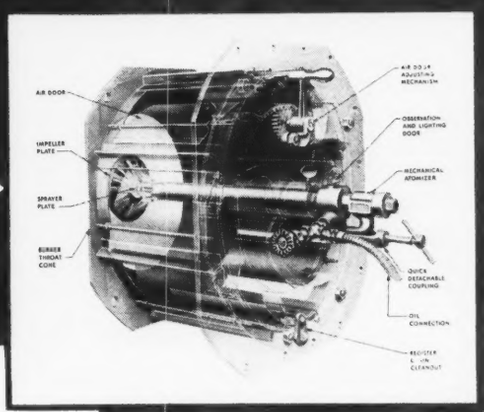
B&W Water-Cooled Furnace Constructions make possible furnaces of any size, shape or form, suitable for any fuel or combustion method in which complete or partial water cooling is desirable. Illustration shows one type of B&W Water-Cooled Furnace construction.

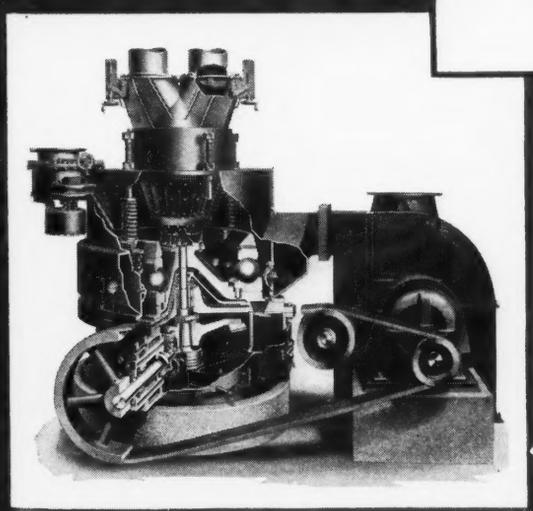
BABCOCK &

THE BABCOCK & WILCOX COMPANY

ASSURANCE OF MAXIMUM PERFORMANCE . .







G-236F

BABCOCK & WILCOX

85 LIBERTY STREET, NEW YORK, N. Y.

The loss to production of the 15,000 workers killed or injured every day means fewer ships, tanks, planes, guns, and other necessary war material. To reduce this loss of Manpower, this Company has subscribed to the National Safety Council's War Production Fund to Conserve Manpower.

WHEN YOU WANT T
YOU WANT A-E-CO T

PROBLEM:

The selection of fuel firing equipment by a municipal electric light plant for a high pressure boiler supplying modern turbine generating equipment. Most important factor was reliability—together with equipment which would preclude any problem of flame stability and the need for auxiliary fuel at lower steaming rates.

SOLUTION:

A Taylor Hydraulic Ram-Driven Stoker was installed under a high pressure boiler of 100,000 lbs. per hour capacity. The furnace was equipped with A-E-CO inclined side water walls and rear waterwall.

RESULTS:

For the two-year period of 1940-1941, 593,070,000 lbs. of steam were generated, burning 54,326,000 lbs. of coal. The average evaporation for the period was 10.9 lbs. of steam per lb. of coal; average B.T.U. per lb. coal as fired 14,267. Operating conditions were: pressure 400 lbs. gauge; steam temperature 725°F.; temperature feed water to boiler 302°F. The combined efficiency of the unit was 84.4%, preheated air temperature to stoker 300 to 325°F.

CONCLUSIONS:

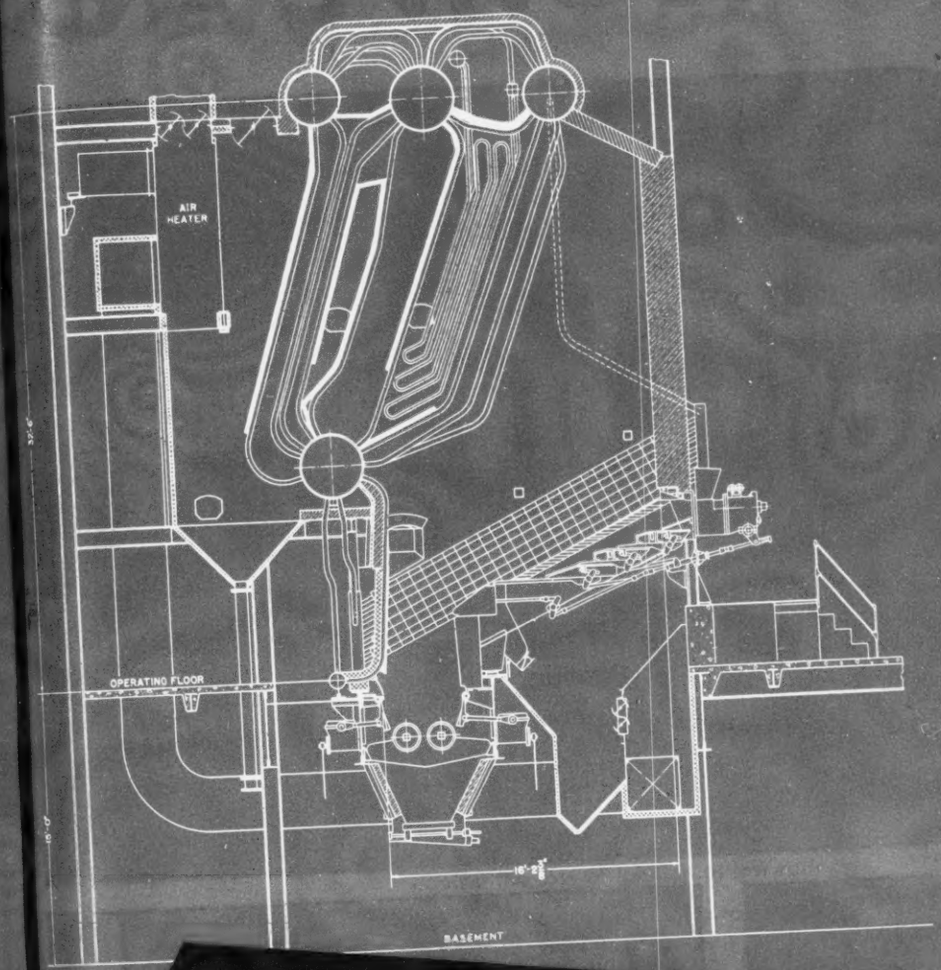
When considering reliability for a light plant load it is necessary to take into account the wide steaming range and the problems of flame stability and use of auxiliary fuel at light ratings. Choice of a Taylor Stoker eliminates all these factors. Ignition is no problem at light steaming loads and auxiliary fuel is not required regardless of the minimum load met.

A CASE IN THE MUNICIPAL PLANT FIELD

AMERICAN ENGINEERING

PHILADELPHIA • PENNSYLVANIA

THESE RESULTS TAYLOR STOKERS



A-E-CO TAYLOR STOKERS ON THE FIRING LINE

*Aluminum Company of America, Edgewater, N. J.
*Aluminum Company of America, New Kensington, Pa.
American Tobacco Co., Inc., Durham, N. C.
Castanea Paper Company, Johnsonburg, Penna.
Chrysler Corporation, DeSoto Plant, Detroit, Mich.
*Collins and Aikman Corp., Roxboro, N. C.
City of Columbus, Ohio
*Consolidated Paper Company, Monroe, Michigan
*Cresson State Sanitarium, Cresson, Penna.
Defiance Milk Products Co., Defiance, Ohio
*DeLaval Steam Turbine Co., Trenton, N. J.
*Detroit Sulphite Pulp & Paper Co., Detroit, Michigan
City of Dover, Ohio
*Draper Corporation, Hopedale, Mass.
Erwin Cotton Mills Co., West Durham, N. C.
*Fisher Body Corporation, Detroit, Michigan
Fisher Body Corporation, Fleetwood Plant, Michigan
*Fisher Body Corporation, Grand Rapids, Michigan
*Fisher Body Corporation, Pontiac, Michigan
Fox Paper Company, Lockland, Ohio
*Froedtert Grain and Malting Co., Milwaukee, Wisc.
*City of Galion, Ohio
*Gardner-Richardson Company, Lockland, Ohio
*General Electric Company, Erie, Penna.
*General Electric Company, Fort Wayne, Ind.
*Greenwood Electric L. & W. Plant, Greenwood, Miss.
*Board Public Works, Hannibal, Mo.
Hill School, Pottstown, Penna.
*Hobart Mfg. Co., Troy, Ohio
*City of Holland, Michigan
*Hope Natural Gas Co., Cornwell Station, West Va.
Hudepohl Brewing Co., Cincinnati, Ohio
Industrial Cotton Mills, Rock Hill, S. C.
*City Water & Light Plant, Jonesboro, Ark.
Kohler Company, Kohler, Wisc.
Maryland State Penal Farm, Roxbury, Md.
*Maybury Sanitarium, Northville, Michigan
Michigan Carton Company, Battle Creek, Michigan
*Michigan State College, East Lansing, Mich.
Municipal Light Plant, Marshfield, Wisc.
*Pacific Mills, Lyman, S. C.
*Packard Motor Car Co., Detroit, Michigan
*Municipal Electric Plant, Painesville, Ohio
*Park Drop Forge, Cleveland, Ohio
*Pennsylvania Electric Co., Seward, Penna.
*Pennsylvania R. R. Co., Philadelphia, Penna.
*Picatinny Arsenal, Dover, N. J.
*Pittsburgh Plate Glass Co., Barberton, Ohio
Borough of Quakertown, Quakertown, Penna.
Raleigh Wyoming Mining Co., Glen Rogers, W. Va.
*Rhinelander Paper Company, Rhinelander, Wisc.
City of Richland Center, Wisconsin
*City of Richmond, Indiana
Sayles Biltmore Bleachery, Biltmore, N. C.
Scotten Dillon Company, Detroit, Michigan
Shelby Cotton Mills, Shelby, N. C.
Sloane-Blabon Corp., Philadelphia, Penna.
*Solvay Process Company, Detroit, Michigan
*St. Elizabeth's Hospital, Washington, D. C.
City of St. Bernard, Ohio
Swarthmore College, Swarthmore, Penna.
*Timken Roller Bearing Co., Canton, Ohio
Timken Roller Bearing Co., Gambrinus, Ohio
Municipal Water & Light Plant, Tippecanoe City, O.
City of Toledo, Ohio
*Union Bleachery, Greenville, S. C.
Union Mills Paper Mfg. Co., New Hope, Penna.
*University of Wisconsin, Madison, Wisc.
*Vassar College, Poughkeepsie, New York
*Borough of Vineland, New Jersey
Warfield Natural Gas Company, Harold, Kentucky
White Sewing Machine Co., Cleveland, Ohio
Whiting Plover Paper Company, Stevens Point, Wisc.

(*) *Represents repeat orders.*

A-E-CO TAYLOR STOKER

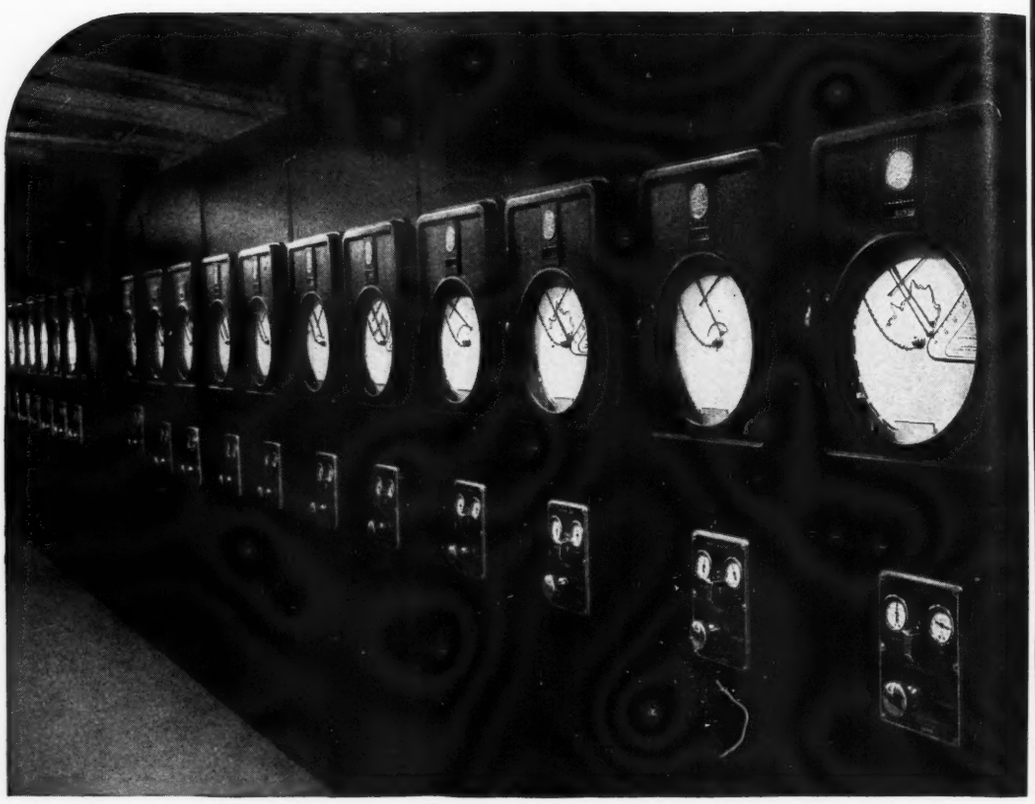
A-E-CO TAYLOR STOKERS
WATER WALLS · ASH HOPPERS
HELE-SHAW FLUID POWER
MARINE DECK AUXILIARIES
LO-HED HOISTS

COMPANY

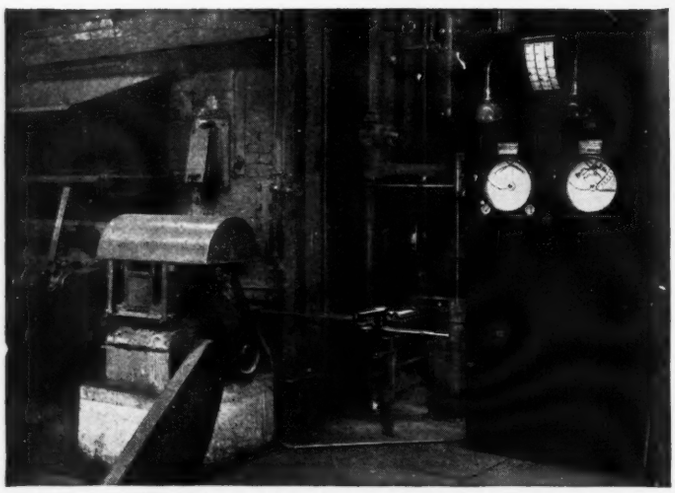
BEFORE YOU BUY ANY FUEL FIRING EQUIPMENT CONSIDER EACH OF THESE 12 FACTORS

1. **RELIABILITY**—the ability to operate with minimum outage and minimum standby equipment.
2. **CAPACITY**—the ability to provide adequate prime capacity ratings, with sufficient reserve capacity for emergencies.
3. **MAINTENANCE**—the ability to operate continuously with minimum repair costs.
4. **FLEXIBILITY**—the ability to follow the steam demand upward or downward . . . quickly and without sacrificing efficiency.
5. **EFFICIENCY**—the proved **dollar** efficiency (total cost of steam production) as shown by actual performance in similar installations.
6. **OPERATION**—the ability to operate continuously, the number and type of operations required, the ease of combustion adjustments, etc.
7. **ADAPTABILITY**—the ability to meet special and limiting conditions, present and future—structural limitations, utilization of present equipment, growth and change of power service demands.
8. **FUEL FLEXIBILITY**—the ability to burn efficiently and easily fuels from many sources having widely varying characteristics.
9. **REFUSE DISPOSAL**—the ability to economically eliminate ash or refuse and the opportunities of disposal at low cost, no cost, or profit.
10. **STACK DISCHARGE**—the practical elimination of "smoke nuisance" without special equipment.
11. **SPACE REQUIREMENTS**—the ability to conform to existing or future space limitations, to short and wide or long and narrow furnaces. Also the accessibility of component parts for maintenance and operation.
12. **OBSOLESCENCE** — the adaptability of the equipment toward possible future modernization with minimum of complication and outage.

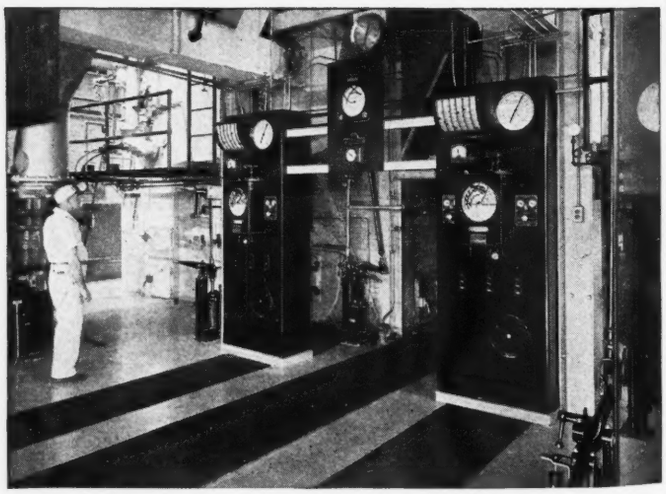
FOR *POWER* TO *SAVE* AND



This installation of Bailey Meter Control on gas fired boilers in a Western Steel Mill paid for itself in Six Months.



This installation of Bailey Meter Control on stoker fired boilers in a Southern Textile Mill paid for itself in Three Months.



This installation of Bailey Meter Control on pulverized coal fired boilers in a Metropolitan Food Processing Plant paid for itself in Ten Months.

BAILEY METER CONTROL . . .

BOILER METERS • MULTI-POINTER GAGES • FLUID METERS • RECORDERS • SUPERHEAT

ENGINEERS WHO WANT SERVE WITH SAFETY

• • • • Power Engineers using Bailey Meter Control tell us that it helps them to reduce fuel and maintenance costs, to render better power service, and to operate with increased safety. They say:

Fuel and Maintenance Savings

Operating records show that the fuel savings created by Bailey Control as compared to manual control average slightly over 5%, and in certain installations run as much as 13%.

Furnace maintenance costs are lowered because of the continuous check and readjustment of fuel—air ratio which avoids excessive furnace temperatures.

Better Power Service

Constant steam pressure insures satisfactory process operations in the factory and full capacity and efficiency from prime movers in the generator room.

Powerful control drives and valves acting simultaneously on all control points of the boiler enable the control to accurately take the boiler through rapid and heavy load swings.

Boiler availability is increased by fewer and shorter outages for boiler and furnace repairs.

Increased Operating Safety

Automatic readjustment of fuel—air ratio affords insurance against furnace explosions by maintaining a safe efficient mixture at all times.

Limit stops on air flow control and accurate furnace draft control protect against the loss of ignition at low ratings.

In emergencies control automatically maintains steam pressure and combustion efficiency, leaving the operating personnel free to deal with the cause of the emergency.

Control may be arranged with interlocks to automatically prevent hazardous conditions by tripping out certain equipment upon the failure of other units. A case in point is the use of interlocks to shut down forced draft and fuel feed upon the failure of induced draft.

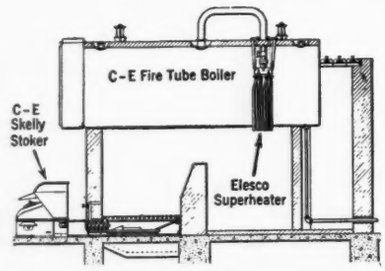
It Saves and Serves with Safety

Bailey Meter Control is a high return investment which will help you to improve your power service. Send for Bulletin No. 102-B to get the details of this system which Saves and Serves with Safety. A-62

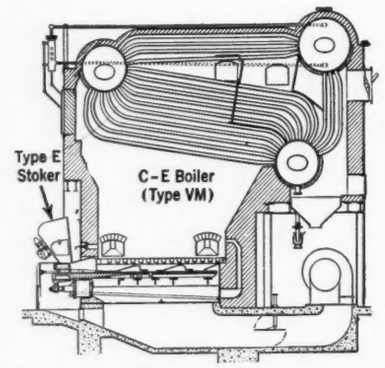
BAILEY METER COMPANY
1036 IVANHOE ROAD • CLEVELAND, OHIO
BAILEY METER COMPANY LIMITED, MONTREAL, CANADA

The Complete Combustion Control System

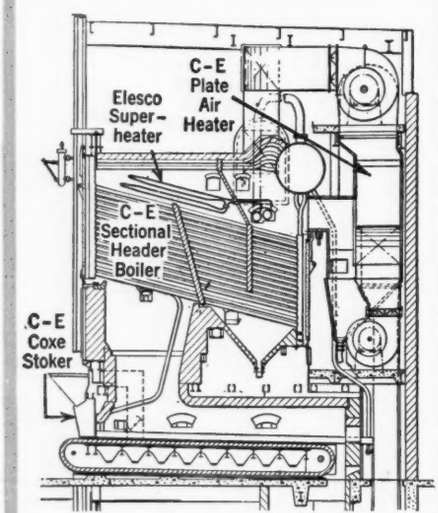
CONTROL • DESUPERHEAT CONTROL • COMBUSTION CONTROL • FEED WATER CONTROL



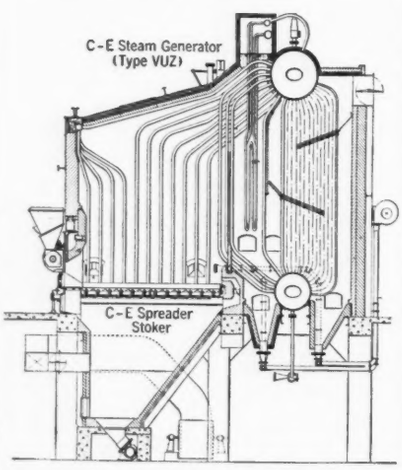
A small unit installed in a Textile Plant. Capacity — 6500 lb per hr. Design Press. — 150 lb.



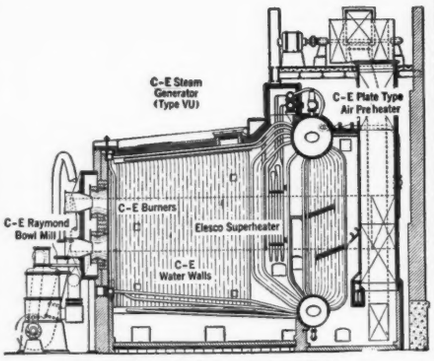
This unit installed for a Tobacco Company. Capacity — 23,000 lb per hr. Design Press. — 275 lb.



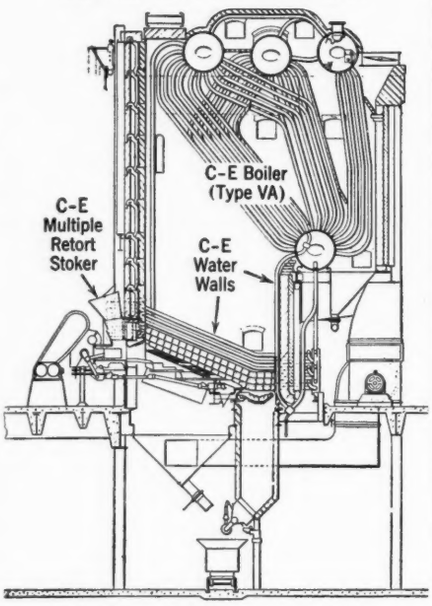
One of two similar units installed for a University. Capacity—75,000 lb per hr. Design Press.—250lb. Steam Temp.—508F.



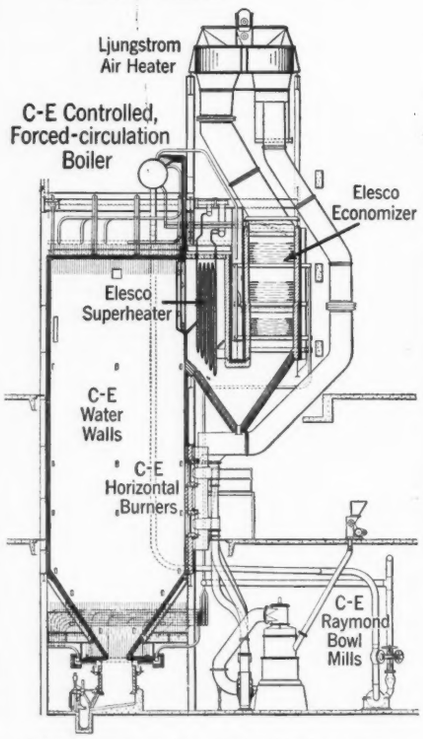
One of three duplicate units installed for a Cement Company. Capacity—38,800 lb per hr. Design Press.—275 lb. Steam Temp.—505F.



One of three similar units installed in a Plastics Plant. Capacity—60,000 lb per hr. Design Press.—650 lb. Steam Temp.—655F.

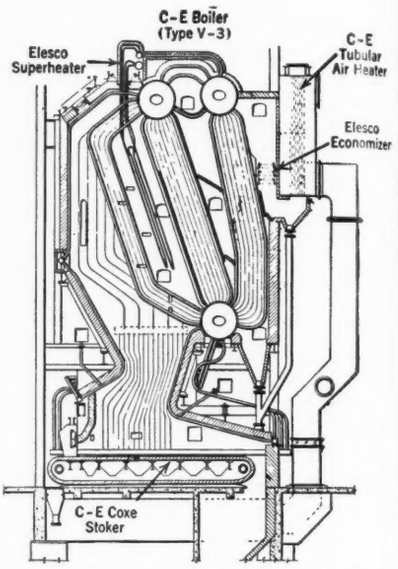


One of three duplicate units for an Automobile Plant. Capacity—45,000 lb per hr. Design Press.—225 lb.

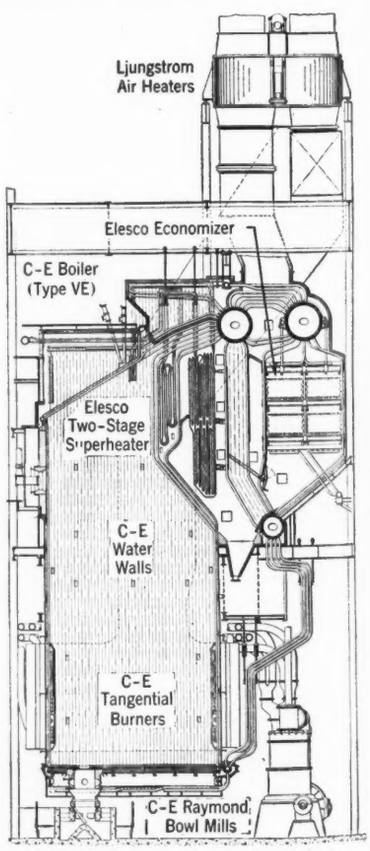


C-E Controlled, Forced-circulation Boiler for a Synthetic Rubber Plant. Capacity — 350,000 lb per hr. Design Press. — 800 lb. Steam Temp. — 750F.

C-E



One of two units installed in a Public Utility Plant. Capacity — 80,000 lb. per hr. Design Press.—425 lb. Steam Temp.—775 F.



A large unit for a Public Utility Plant. Capacity—1,000,000 lb per hr. Design Press.—1800 lb. Steam Temp.—955F.

EQUIPMENT...

MEETS EVERY SERVICE CONDITION

FROM SMALL INDUSTRIAL PLANTS TO THE LARGEST UTILITY STATIONS

BOILERS The C-E Boiler line includes virtually all water tube and fire tube types in commercial use today for both stationary and marine application. Bent tube types comprise 2-, 3-, 4-drum and multidrum designs. Straight tube types include both sectional header and box header designs, and the fire tube boiler line covers internal furnace, two-pass semi-portable and both standard HRT and Nuway types. Waste heat boilers in bent tube, straight tube, fire tube and forced circulation types are available.

STOKERS Combustion Engineering has the most comprehensive line of stokers of any manufacturer. There are four underfeed types—the C-E Skelly, the Low Ram and the Type E which are single retort types and the MRO, a multiple retort design. C-E overfeed stokers include both traveling grates (forced draft type) and chain grates (forced and natural draft types) as well as a spreader stoker. The complete C-E line provides a type and size of stoker for every requirement.

PULVERIZED FUEL EQUIPMENT The application of pulverized fuel firing to power boilers was pioneered by Combustion Engineering. C-E developments which include the use of water cooled walls and water screens, C-E Raymond Mills and C-E Burners are largely responsible for the position of eminence which pulverized fuel firing holds today in the field of steam generation.

RELATED EQUIPMENT In addition to all types of boilers and fuel-burning equipment, Combustion Engineering offers water-cooled furnaces—pioneered by C-E in the early 1920's—Elesco Superheaters and Economizers in designs suitable for all requirements, as well as C-E Air Heaters in both plate and tubular types.

A-700

COMBUSTION ENGINEERING

COMPANY, INC., 200 MADISON AVENUE, NEW YORK, N.Y.

Conservation of boilers

Don't have to say:

"ANOTHER BOILER DOWN FOR REPAIRS"

Time was when you would have taken a situation like this as an inevitable matter of course. You would have had the reserve capacity to make all the steam you needed. You had, or could easily get, replacement parts. We weren't at war then. Steel wasn't on the critical list. Today, a tube failure is often a near calamity. A boiler down may mean a serious delay in war production. You can't afford to let it happen. It won't if your plant has "preventive care."

is a wartime MUST!

Clearly . . . You can't have your cake and eat it.
Materials shortage makes replacement a headache.

NOTHING could be plainer. With everything made from steel next to impossible to get, you're faced right now with a repair parts problem. There's only one way out—you've got to make the most of everything you have. You've got to keep it working. It's become a wartime "must."

> . . . if Hall Boiler Plant Service had been expressly created to help you in this situation it couldn't have been better designed for the task.

For Hall Service is definitely designed to give "preventive care." It works on the principle that when the right things are done at the right time, boiler troubles will be caught before they get a start. Many repairs won't be needed. Scale, corrosion, carryover and embrittlement, the ever-present enemies of steam output, will be kept under perpetual control.

The origin of this service dates back to World War I. Old-timers in the power field don't need to be reminded of the appalling situation they faced when real "preventive remedies" for boiler ills were practically unknown. It was Hall research, born of this need, in 1922, which has since paid rich dividends to American industries. Not a high-pressure boiler in use today fails to benefit from it, not a low-pressure boiler to which its benefits are not equally available.

No ordinary routine comprises a Hall Field Engineer's work. In close cooperation with the power plant operator every possible avenue for trouble from water is watched. A system is set up which, if properly followed, reduces boiler outages therefrom to a positive minimum. Continuous peak steam production is a practical certainty.

If you have been, or may soon be facing the inevitable penalty of pushing your equipment to the limit, this is the time to find out what Hall Service is accomplishing in hundreds of America's war industries. Write, phone or wire.

HALL LABORATORIES, INC., HAGAN BLDG., PITTSBURGH, PA.

HALL SERVICE IN A NUTSHELL

At your immediate disposal are placed the technical knowledge and facilities of the pioneering leaders in scientific boiler water conditioning.

In addition, with your full cooperation, Hall Service:

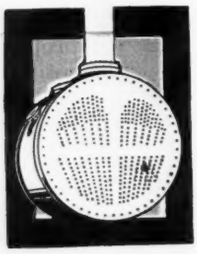
1. Minimizes boiler outages caused by water.
2. Helps maintain highest efficiency.
3. Establishes non-embrittling water.
4. Minimizes carryover.
5. Prevents corrosion in boilers and associated equipment.
6. Prevents deposition in water lines and cooling systems.

HALL SYSTEM *of Boiler Water Conditioning*

REVERE copper and

FOR POWER SERVICE

CONDENSER TUBES



Revere condenser and heat exchanger tubes are available in a number of alloys with a comprehensive range of characteristics which adequately meet the requirements of industry. In general, the development of special alloy tubes has been made with the intention of supplying alloys, which because of their composition, are not subject to dezincification and which, in addition, have tough, tenacious protective films which give them a high resistance to erosion and impingement attack.

Revere produces its tubes by improved manufacturing methods that provide tubes of unusual mechanical soundness and surface perfection. Revere tubes are available from ⅝" to 2" O.D., with wall thicknesses from No. 8 to No. 19 Stubs Gauge.

70-30 Cupro-Nickel. Containing no zinc, Revere tubes of this alloy are not subject to dezincification. In addition they develop an especially tenacious surface film, highly resistant to impingement attack and erosion. 70-30 Cupro-Nickel tubes are generally recognized as the finest condenser tubes available for severe conditions. Where conditions are less severe, 80-20 Cupro-Nickel may be used with economy.

Admiralty. Condenser tubes of Admiralty Metal have long been considered standard. The mechanical excellence of Revere tubes makes Admiralty a sound specification in perhaps the majority of installations. Revere has now standardized on the inclusion of .03% of arsenic in all Admiralty tubes to inhibit dezincification.

Red-Brass. An alloy of 85% copper and 15% zinc. Revere Red-Brass has excellent corrosion resistance to a variety of water conditions, and is practically immune to dezincification. It is recommended for general piping purposes as giving excellent service at a moderate cost.

Arsenical Copper. 99.7% copper, 0.3% arsenic. Arsenical Copper with .30% arsenic content, is suitable for fresh water service where corrosive conditions are mild. It has also given satisfactory service in many installations where Muntz Metal and Admiralty were previously used. It has a higher thermal conductivity than either Admiralty or Muntz Metal and is more resistant to scaling under conditions of high temperature operation.

Muntz Metal. 60% copper, 40% zinc. Muntz Metal tubes are satisfactory in fresh water steam power plant installations where the corrosion problem is mild. While the extrusion process is generally used by Revere in connection with the production of condenser and other engineering tubes, Muntz Metal tubes are manufactured by the Mannesman process.

TUBE SHEETS

Revere plates are produced by rolling, under extremely close technical control, insuring sound metal with a dense structure free from blow holes and surface imperfections. Furnished principally in Muntz Metal and Naval Brass, they can also be supplied in other alloys for special applications. They are available in the form of squares, rectangles, circles, half-circles, segments and irregular patterns.

COPPER WATER TUBE

Because Revere Copper Tube is non-rusting, it is not necessary to install oversize lines to allow for accumulation of rust. The gun-barrel finish of Revere Tubes cuts down friction and facilitates the rapid passage of liquids, air or gas. Joined with soldered or compression fittings, Revere Copper Tube forms a superior installation at reason-

REVERE COPPER AND BRASS INCORPORATED

Sales Offices and Distributors in most of America's major cities · MILLS: BALTIMORE, MD. · TAUNTON, MASS. · ROME, N. Y.

copper alloys

able cost. It is available in four types for different services ranging from general plumbing to various process applications.

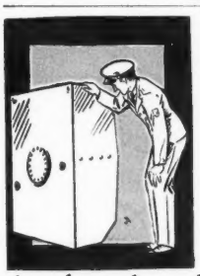
BRASS AND COPPER PIPE

Revere produces Red-Brass as well as 99.9% pure copper pipe in standard pipe sizes. The Revere Technical Advisory Service will gladly help to determine the most economical and dependable type of pipe for your purposes.

BUS BAR

Revere high-conductivity Copper Bus Bar is uniform in section and mechanically sound. It is supplied in tubular, rectangular, and specially drawn or extruded shapes.

HERCULOY



Herculoy is Revere's patented silicon bronze alloy which combines corrosion resistance similar to that of pure copper with strength equivalent to that of low and medium carbon steel. It is particularly recommended in applications where copper would present adequate resistance to corrosion, but where the high strength, ready weldability and other physical characteristics of Herculoy render it valuable as a structural material. Tanks, bolts, nuts, turnbuckles, lag screws, screw machine parts and accessories are some of the applications in which the great strength and corrosion resistance of Herculoy can offer particular advantages.

Free—Write for Revere's 3 booklets on Copper and Copper Alloys For Power Plants . . . For The Mechanical Industries . . . For The Process Industries.

Executive Offices: 230 Park Avenue, New York

NEW BEDFORD, MASS. • DETROIT, MICH. • CHICAGO, ILL.

UNCLE SAM IS FIRST

The same properties of copper and copper-base alloys that make them superior for industrial use have made them absolutely vital for war materials.

The Revere metals described on these pages are restricted by order of the War Production Board. They may be sold and used only in accordance with Federal regulations in effect at the time they are ordered.

Revere offers full cooperation in helping you to overcome new engineering problems arising from the requirements of victorious war.

"No Maintenance in 3 YEARS"

THE CLEVELAND TRACTOR COMPANY

BUILT TO Cletrac ENDURE

CLEVELAND, OHIO
U. S. A.

November 3, 1936

The Hoffman Combustion Engineering Co.,
410 Ford Building,
Detroit, Michigan.

Gentlemen:

We installed three Hoffman Firite Automatic Stokers under Erie City 150 HP - HRT Boilers in October, 1933. One more unit was installed in October, 1934. As yet, we have had no maintenance cost on these stokers.

During the last winter, due to coal shortage we used nut and slack coal from Ohio mines. For at least thirty days we burned Miners' slack exclusively until we were able to procure our regular supply.

These stokers have performed satisfactorily in every way. We will be more than pleased to show our Hoffman Firite installation to anyone interested.

Very truly yours,

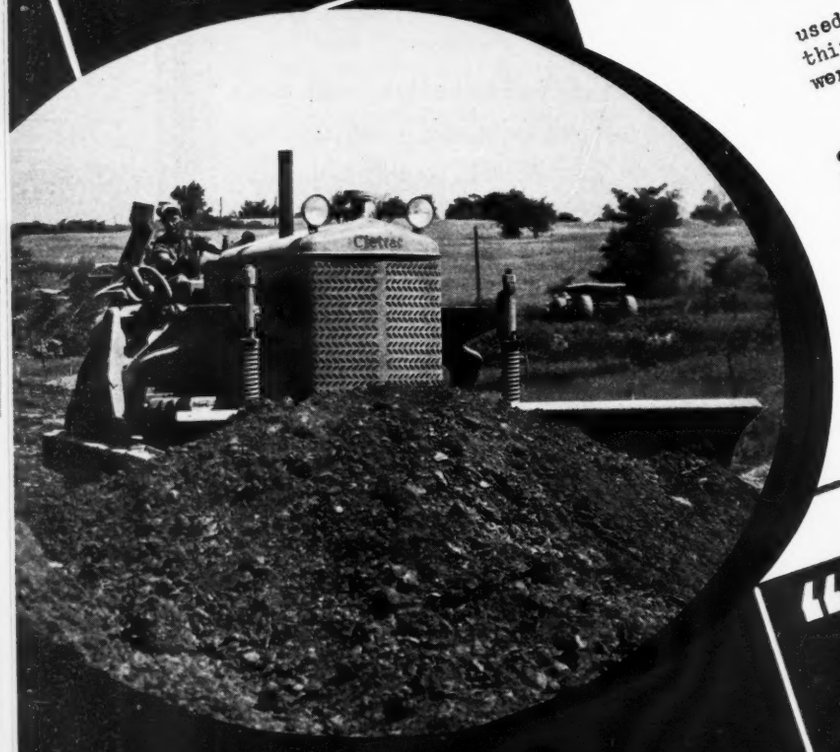
THE CLEVELAND TRACTOR COMPANY

A. Fussner

Maintenance Engineer

A. Fussner:FM

"Burned Miner's slack during coal shortage"

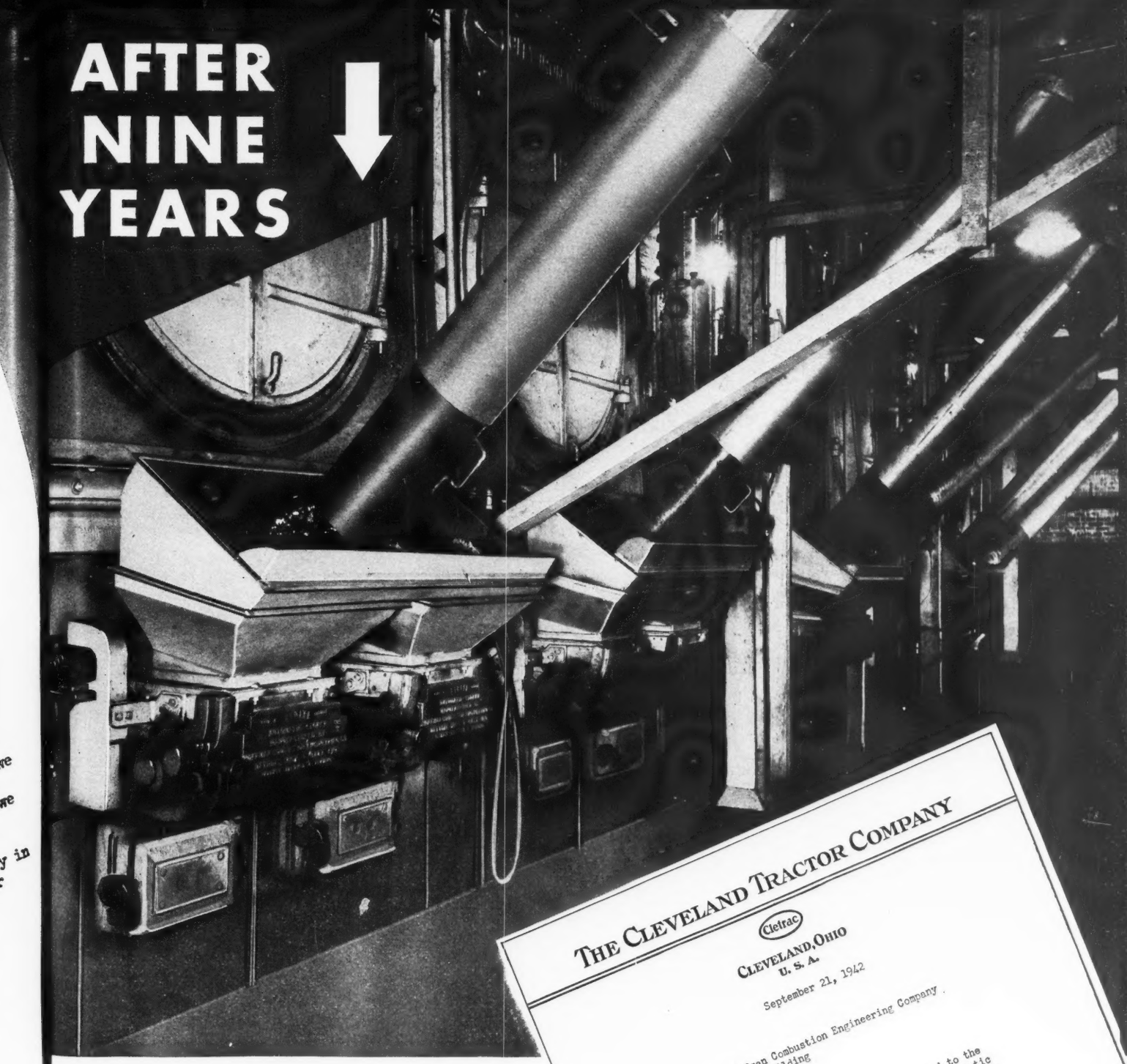


"Satisfactory in Every Way"

says CLEVELAND TRACTOR CO

HOFFMAN COMBUSTION

AFTER NINE YEARS



THE CLEVELAND TRACTOR COMPANY

Cletrac

CLEVELAND, OHIO
U. S. A.

September 21, 1942

The Hoffman Combustion Engineering Company
Marquette Building
Detroit, Michigan

Gentlemen:

We are writing you in regard to the maintenance cost on our four Hoffman Automatic Stokers, covering the period from 1933 to date.

The average cost has been $3.45 per stoker per year, covering the nine-year period.

In view of the above figures, we are more than pleased with Firite Stokers, and when we install additional stokers, we would not be satisfied with any other than "Firites".

Very truly yours,

THE CLEVELAND TRACTOR COMPANY

A. Fussner
Maintenance Engineer

AF:fm

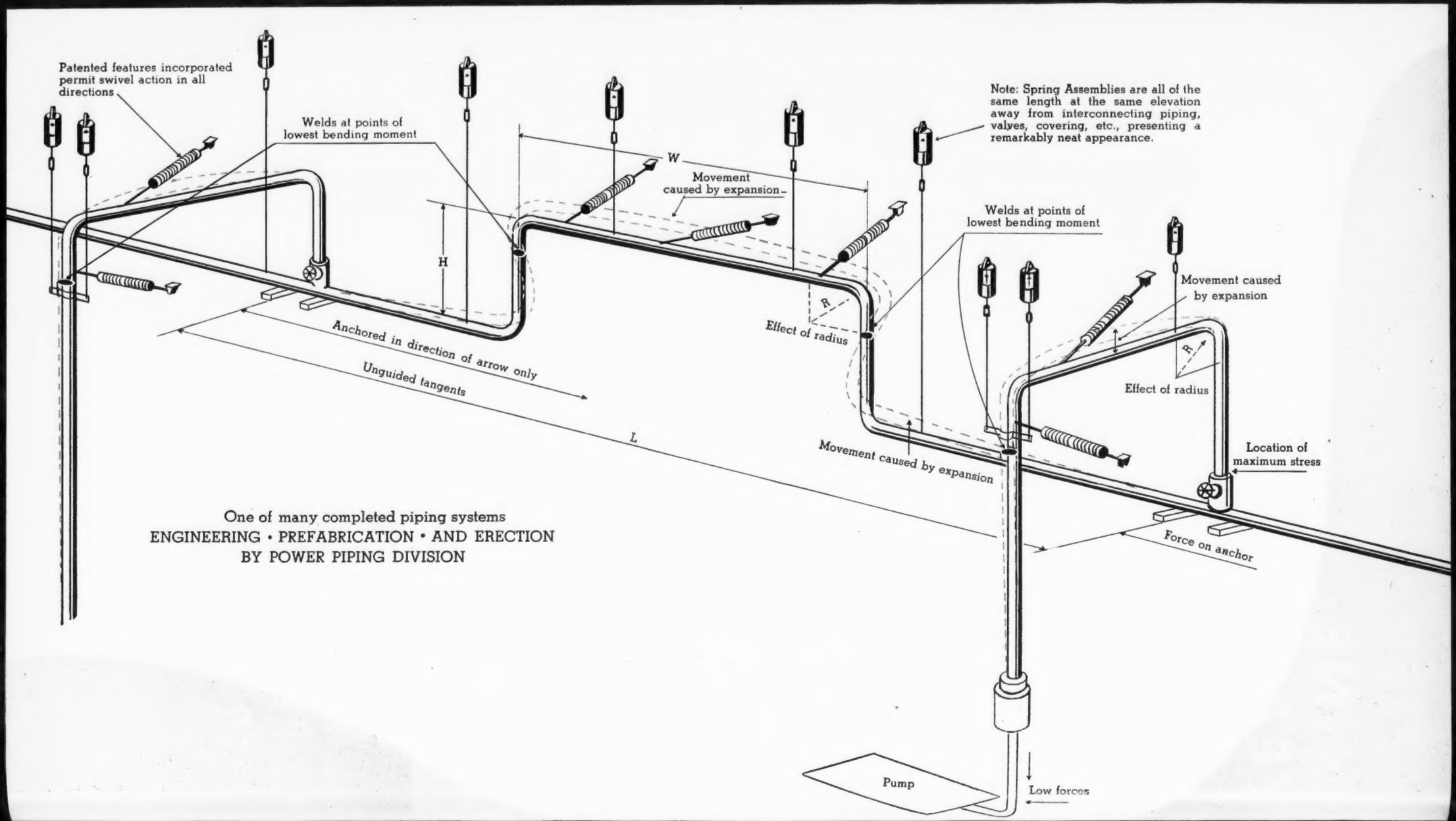
Satisfied ownership—that's the story of FIRITE Stokers in hundreds of plants.

TAL MAINTENANCE .45 PER STOKER PER YEAR

Firite SPREADER TYPE

NGINEERING COMPANY

THE SCIENTIFIC APPROACH TO YOUR PIPING PROBLEMS


Patented features incorporated permit swivel action in all directions
Welds at points of lowest bending moment
W
Movement caused by expansion
H
Note: Spring Assemblies are all of the same length at the same elevation away from interconnecting piping, valves, covering, etc., presenting a remarkably neat appearance.
Welds at points of lowest bending moment
Movement caused by expansion
R
Effect of radius
Anchored in direction of arrow only
Unguided tangents
L
Movement caused by expansion
Effect of radius
Location of maximum stress
Force on anchor
Pump
Low forces

One of many completed piping systems
ENGINEERING • PREFABRICATION • AND ERECTION
BY POWER PIPING DIVISION

Low forces

POWER PIPING DIVISION presents the ultimate in ENGINEERING • PREFABRICATION • ERECTION

• Engineering

The employment of FLEX-ANAL CHARTS* enabling engineers to simplify and quickly arrive at an economical design.

• Prefabrication

All sub-assemblies are completed under rigid engineering control. This results in a negligible amount of field welding and simplifies erection.

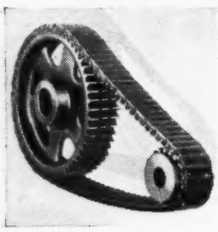
• Erection

Highly developed procedures employed provide the last word in economical erection. The use of Functional Hangers and Vibration Eliminators adequately control the behavior of your piping system.

*The correlated use of FLEX-ANAL CHARTS and HANGER BULLETIN 1863 saves time in engineering man power which can be devoted to other useful purposes. Copies of these books can be obtained through a request on your business letterhead.

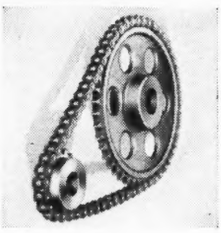
BLAW-KNOX COMPANY
POWER PIPING DIVISION
1525 PENNSYLVANIA AVE., PITTSBURGH, PA.

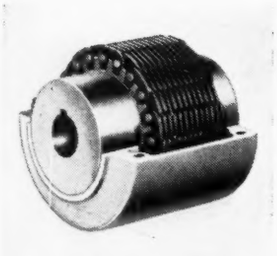
AN IMPORTANT ADVANTAGE IN PLANNING POWER DRIVES

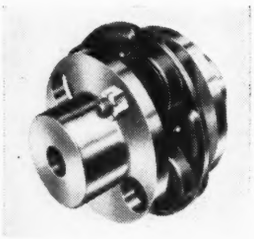


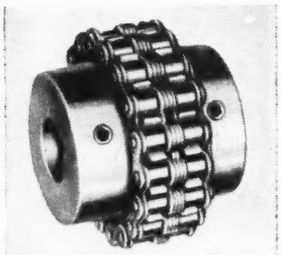
Morse Silent Chain Drives operate at practically 100% efficiency, year after year. Quiet and smooth in operation, they insure maximum machine output. The Morse principle of "Teeth, Not Tension," means no slip—no wasted power. Wide range of chain capacities.

Morse Roller Chain Drives are equipped with effective "oil feed" system in every link. This exclusive design gets oil to the heart of chain. Oil gets in, wear stays out! They last longer, require less maintenance. Interchangeable and available in single and multiple widths.









Morse Silent Chain Couplings compensate for shaft misalignment. This simple and rugged coupling consists of two facing steel sprockets wrapped with Morse Silent Chain—enclosed in a machined split case. Links acting on sprocket teeth form flexing medium. They are easily installed and available in many sizes.

Morse Morflex Couplings contain two steel hub members and a floating center unit assembly to which each hub is separately connected through resilient rubber trunnion blocks. There is no metal on metal movement. Rubber allows for maximum distortion without loss of efficiency. Cuts maintenance cost.

Morse Roller Chain Couplings embody many outstanding features that make for unusual flexibility and long-life. Highly compact, they consist of two facing sprockets wrapped with Morse Roller Chain. Easy to install and align. Wide range of stock and special sizes—covers if desired. Send for coupling data today.

SILENT CHAINS ROLLER CHAINS FLEXIBLE COUPLINGS CLUTCHES

MORSE *positive* DRIVES

MORSE CHAIN COMPANY ITHACA N. Y. DIVISION BORG-WARNER CORP.

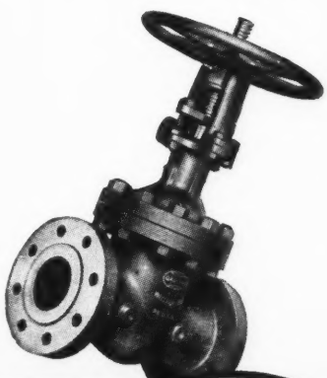
There's a Shortage of DARLING GATE VALVES IN THE JUNK PILE

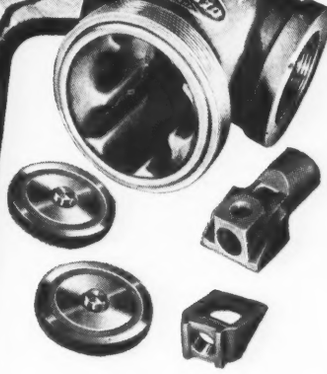
Today, junk piles are being combed for every valve that can be salvaged. Chances are, you won't find a single Darling Gate Valve—because they just *don't* end up in the junk pile! Darling Gate Valves stay on the job—right in the line—year after year—delivering tighter seating, better performance, less wear, more efficient operation at lower maintenance cost.

When, after long and severe service, the parts should become worn, there is no need to remove the valve from the line. You just replace 4 simple and inexpensive parts and the Darling Double Disc Gate Valve is again ready for long, hard service.

Darling Valves Are Still Available To Industry!

In spite of our heavy war production schedule, we *do have* industrial valves to sell—perhaps the very ones you need for that critical installation in your plant. We suggest that you phone, wire, or write, giving as much information as possible on your valve requirements, priority ratings, and all other data that will help us expedite shipments to you. Requests will be given immediate attention, in the order received at our plant.





Only 4 PARTS

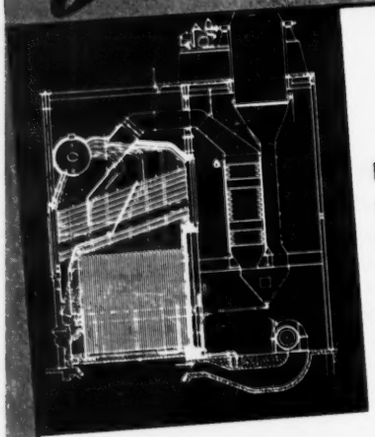
Two discs and two wedges—the entire working part assembly of a Darling Double Disc Gate Valve. There is no other valve with this design. The seats are parallel. The discs are *fully revolving*, seating in a different position each time the valve is operated. This means tighter seating, less wear, longer operation and lower maintenance costs with Darling Gate Valves.

You don't have to take a Darling Double Disc Gate Valve out of the line to replace the parts. Simply insert new and inexpensive assembly parts and replace Stem and Bonnet. Valve is again ready for long, hard service.

TRADE DARLING MARK

DARLING VALVE & MANUFACTURING CO.
WILLIAMSPORT, PA.

These TESTS tell



ORDNANCE PLANT INSTALLATION

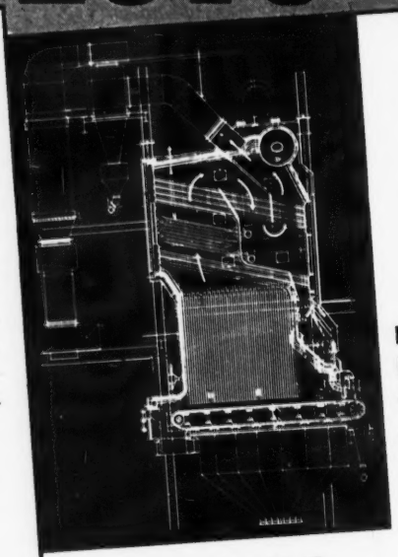
Professors F. A. Berger and H. Kuenzel of Washington University, St. Louis, Missouri, acting in the interests of the War Department were supervisors of this test.

HEATING SURFACE, SQ. FT.:

Boiler	11,427
Water Walls	2,025
Economizer	3,960
Total	17,412 sq. ft.

Fuel — 11,282 B.T.U. as fired Bituminous Coal
Working pressure — 266 lbs. per sq. in.
Steam temperature — Saturation
Feedwater temperature — 224° F.
Steam load — 105,558 lbs.
CO_2 at economizer outlet — 13.9%
Gas temperature leaving economizer — 363° F.
Moisture in steam — .0178%*
Overall efficiency — 84.3%

*Moisture determination made by conductivity meter.



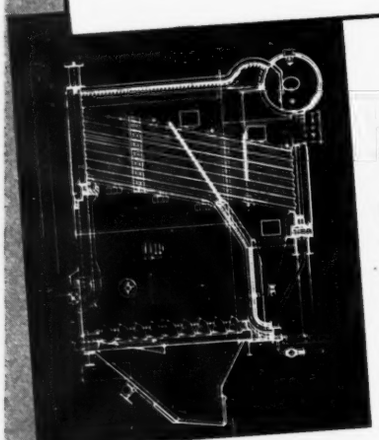
UNIVERSITY POWER PLANT INSTALLATION

This test was supervised by the University of Illinois.

HEATING SURFACE, SQ. FT.:

Boiler	6,600
Water Walls	1,870
Economizer	2,290
Air Heater	4,598
Superheater	1,424
Total	16,782 sq. ft.

Fuel — 9,518 B.T.U. as fired Low Grade Illinois Bituminous Coal
Working pressure — 325 lbs. per sq. in. ga.
Steam temperature — 650° F.
Feedwater temperature — 299° F.
Steam load — 61,686 lbs. per hour
CO_2 at air heater outlet — 13.7%
Gas temperature leaving air heater — 380° F.
Overall efficiency — 82.45%



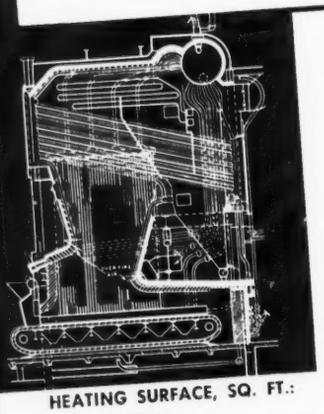
UNIVERSITY HEATING PLANT INSTALLATION

This test was conducted by the University of Wisconsin under supervision of Professor G. L. Larson, Wisconsin University.

HEATING SURFACE, SQ. FT.:

Boiler	5,000
Water Walls	160
Total	5,160 sq. ft.

Fuel — 12,510 B.T.U. Mid-Western Bituminous Coal
Working pressure — 169 lbs. per sq. in. ga.
Steam temperature — Saturation
Feedwater temperature — 164° F.
Steam load — 49,900 lbs. per hour
CO_2 at boiler outlet — 13.65%
Gas temperature leaving boiler — 424° F.
Overall efficiency — 80.06%



MODERN PAPER MILL INSTALLATION

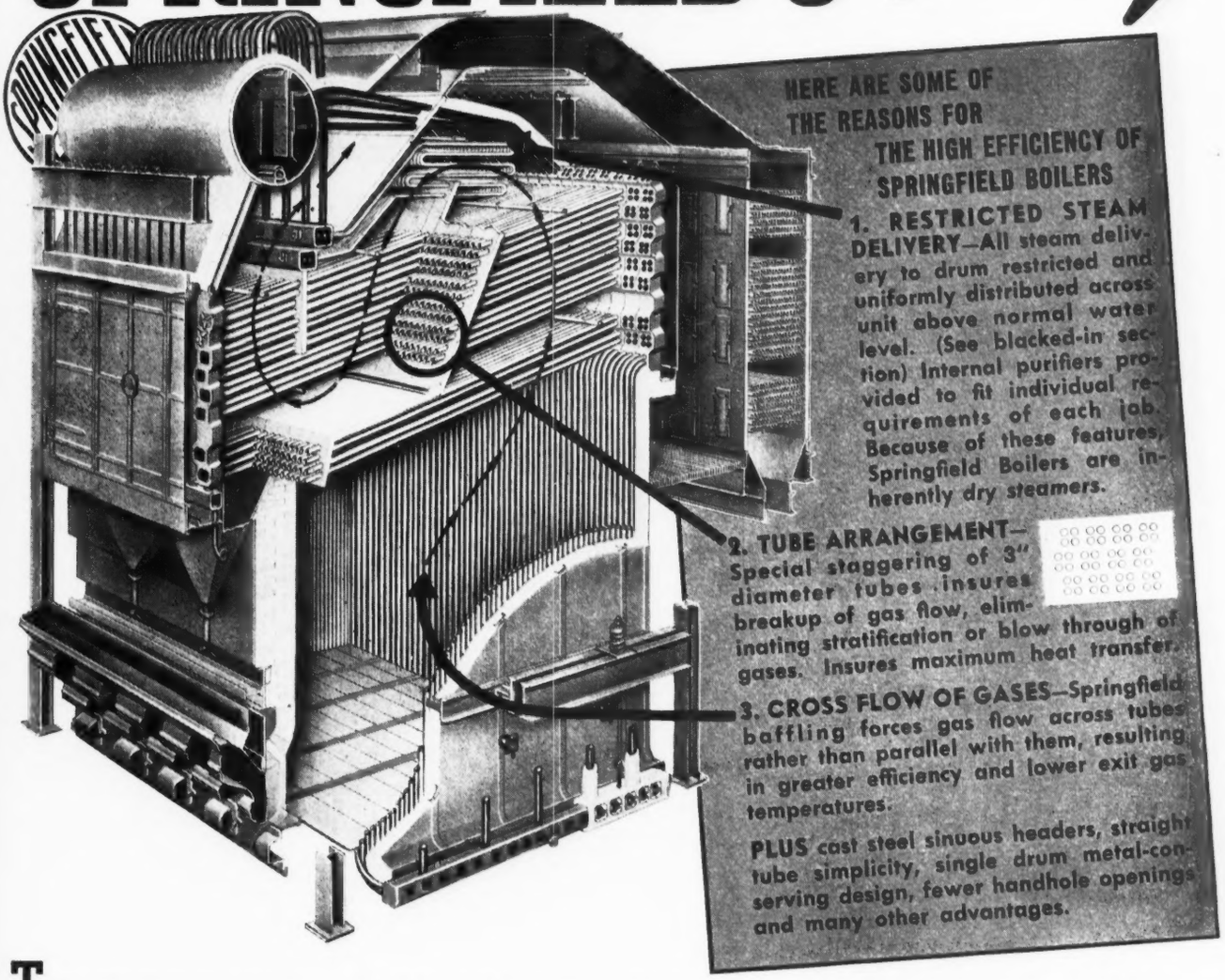
This test was performed by H. M. Wilson Company, Engineers, Philadelphia, Pennsylvania, consultants.

HEATING SURFACE, SQ. FT.:

Boiler	8,800
Water Walls	1,880
Economizer	3,000
Superheater	1,620
Total	15,300 sq. ft.

Fuel — 9,000 B.T.U. as fired Iowa Bituminous Coal
Working pressure — 241 lbs. per sq. in. ga.
Steam temperature — 517° F.
Feedwater temperature — 219° F.
Steam load — 45,625 lbs. per hour
CO_2 at economizer outlet — 12.5%
Gas temperature leaving economizer — 263° F.
Overall efficiency — 83.65%

SPRINGFIELD'S *Story*



HERE ARE SOME OF THE REASONS FOR THE HIGH EFFICIENCY OF SPRINGFIELD BOILERS

1. RESTRICTED STEAM DELIVERY—All steam delivery to drum restricted and uniformly distributed across unit above normal water level. (See blacked-in section) Internal purifiers provided to fit individual requirements of each job. Because of these features, Springfield Boilers are inherently dry steamers.

2. TUBE ARRANGEMENT—Special staggering of 3" diameter tubes insures breakup of gas flow, eliminating stratification or blow through of gases. Insures maximum heat transfer.

3. CROSS FLOW OF GASES—Springfield baffling forces gas flow across tubes rather than parallel with them, resulting in greater efficiency and lower exit gas temperatures.

PLUS cast steel sinuous headers, straight tube simplicity, single drum metal-conserving design, fewer handhole openings and many other advantages.

THE performance data recorded at the left is a concise presentation of Springfield's story — conclusive proof that Springfield Boiler design features will accomplish what is claimed for them. High efficiency, dry steam, low exit gas temperatures and many other operating benefits are the direct result of Springfield's proven principles of design.

War production plants will benefit greatly by the low operating costs, high efficiency, long service life and quicker, easier maintenance of Springfield Boilers. Actual field reports show that, because they are so easily installed, Springfield Boilers can often be put into service 30 to 60 days sooner than other types of boilers.

Much time can also be saved through installation of duplicate units. Complete drawings, patterns, shop fixtures, etc., are on hand to duplicate modern Springfield units built in recent years. Pressures 75 to 750 lbs., or higher. Capacities 5,000 to 450,000 lbs. per hour, or more.

Springfield regularly takes contracts for complete steam generating units. SPRINGFIELD BOILER CO., 1953 E. Capitol Ave., Springfield, Ill.

SPRINGFIELD

STEAM GENERATING UNITS

SPRINGFIELD BOILERS

ANY SIZE ANY FUEL ANY PRESSURE

They all add up to the one

More steam

HAGAN CONTROL ASSURES –

+ MAXIMUM quantity of steam from any given plant, by introducing fuel and air in correct proportion for utmost efficiency.
+ MAXIMUM utilization value, uniform steam pressure and temperature, in accordance with demand.
+ MAXIMUM output from boilers of differing capacities, automatically.
+ MAXIMUM steam for production, by reducing loss of steam in frequent soot blowing.
+ MAXIMUM PROTECTION of auxiliary equipment, fans, stokers, etc. by maintenance of uniform operating conditions.

= *Greater production for war effort*

thing you want most...

for the war effort!

NOTHING in steam boiler equipment is more important to the constant carrying of a war load than AUTOMATIC COMBUSTION CONTROL. It must be adequate, reliable, able to take from your shoulders the responsibility for constant attention . . . to give the utmost freedom from manual adjustment. It should be dependable even if you had to go away in an emergency and leave it.

HAGAN AUTOMATIC COMBUSTION CONTROL will give you that kind of service. It will give it under the most trying conditions. It will assure you instant functioning with the slightest changes in steam header pressure. Since it is *air operated,* Hagan Control assures fast, positive action and remarkable freedom from trouble. Hagan Control installations set up years ago are giving the same excellent service they did in the beginning.

Correct engineering on the soundest principles is the reason for Hagan performance – taking infinite pains to assure the greatest design simplicity and the utmost in flexibility to meet varying plant conditions.

You have a right to expect such results from the pioneers who from the beginning have set the pace for this field. If you are not getting such results from the equipment you are now using look into this. Call for a Hagan combustion specialist . . . Now . . . and put an end to your trouble.

SPECIFIC ADVANTAGES OF HAGAN AUTOMATIC COMBUSTION CONTROL

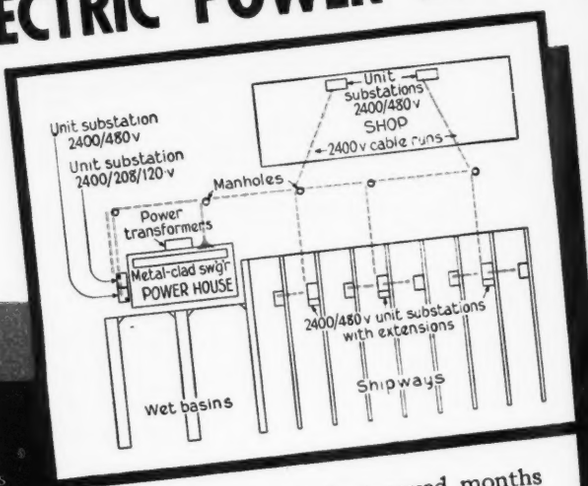
Simplicity of operation.
Ease of installation.
Ruggedness of equipment.
Sensitivity to small load changes.
Accuracy of adjustments for small variations.
Speed of movement, **with stability,** throughout operating range.
Flexibility in meeting individual plant conditions.
Engineered by the pioneers and leaders in automatic combustion control.

HAGAN CORPORATION · HAGAN BUILDING · PITTSBURGH, PA.

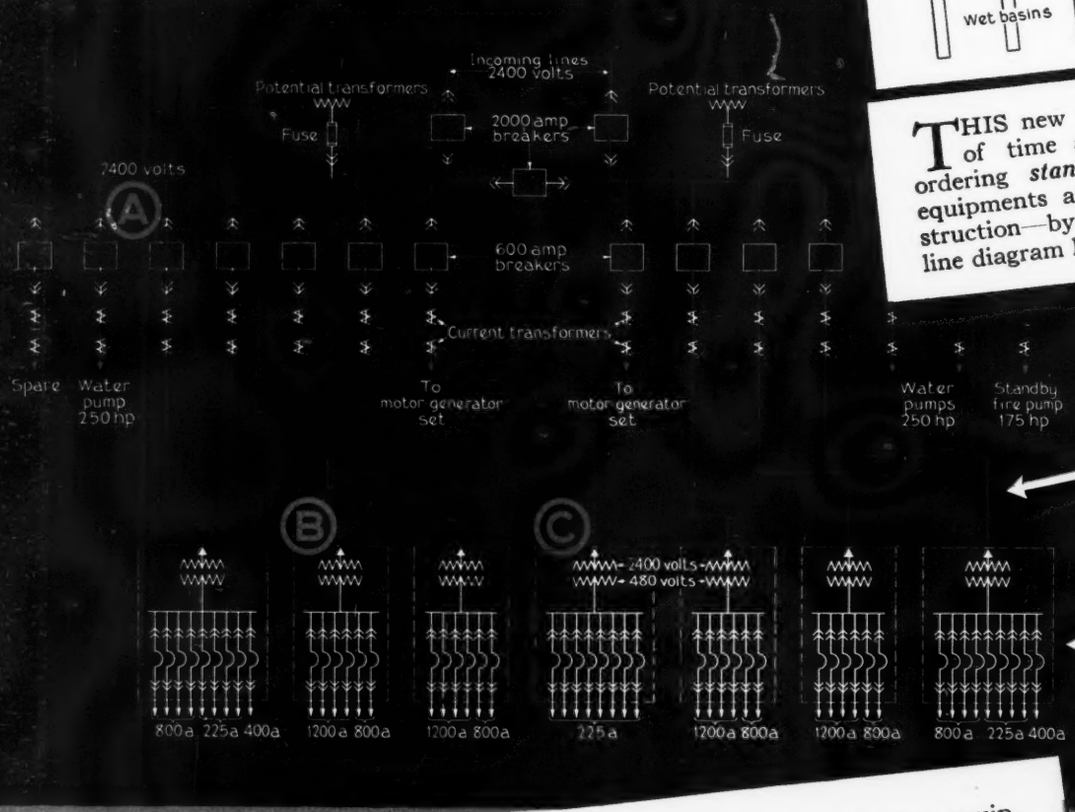
HAGAN *Automatic* COMBUSTION CONTROL
The pioneer . . . and still the leader

1/4 THE TIME 1/7 THE COPPER

AND A BETTER ELECTRIC POWER SYSTEM



THIS new war plant saved months of time and tons of copper by ordering *standard* power distribution equipments at an early stage of construction—by means of a simple one-line diagram like that below.



Power is distributed at high voltage right to unit substations at the load centers—

—from where it is distributed at 480 volts directly to the loads.

Many war-production factories are ordering plant distribution equipments at an early stage of construction by taking these three simple steps:

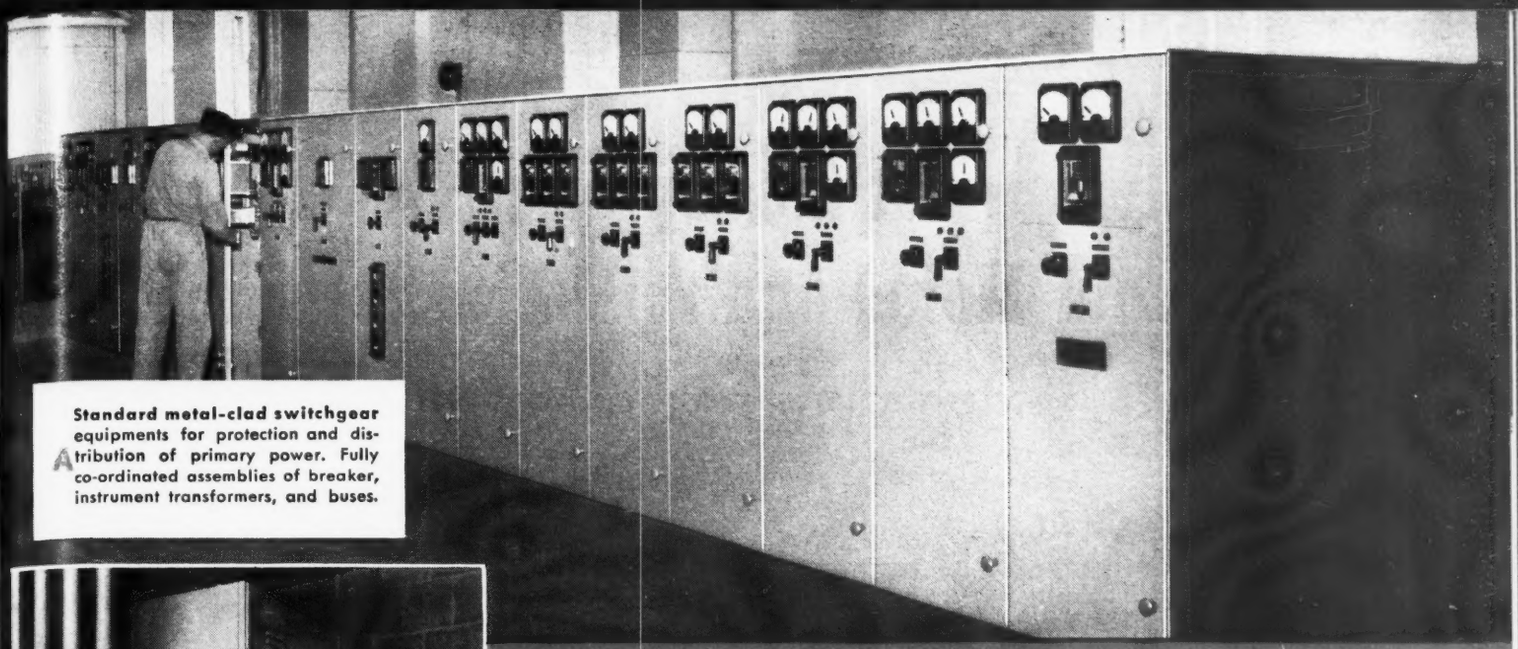
1 *Calculate the total kva you need.* Your consulting engineer can help you to determine this accurately.

2 *Divide the load area into separate load zones of 500, 750, or 1000 kva each.*

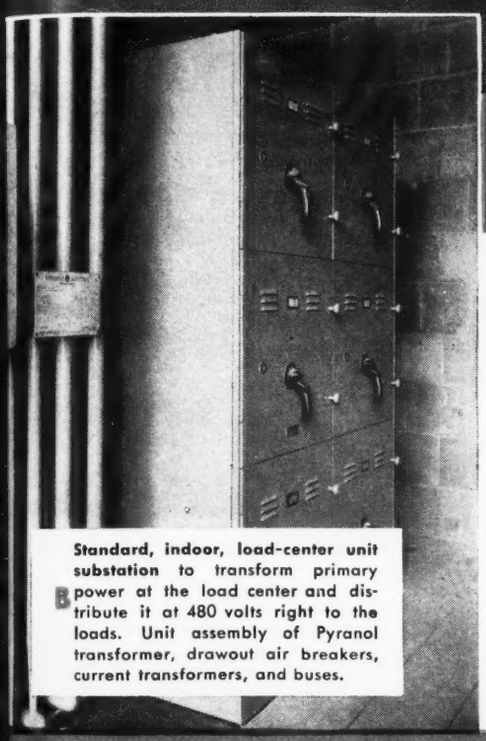
3 *Divide the load of each zone into feeder loads,* and draw a one-line diagram of your proposed load-center system, giving the functions to be performed and the ratings required. *With this one-line diagram you can immediately order standard G-E switchgear equipments and unit substations.*

For further aid, ask for our new bulletin, No. GED-1006.

The Navy "E", for Excellence, has been awarded to 92,700 General Electric employees in six plants manufacturing naval equipment.



A Standard metal-clad switchgear equipments for protection and distribution of primary power. Fully co-ordinated assemblies of breaker, instrument transformers, and buses.



B Standard, indoor, load-center unit substation to transform primary power at the load center and distribute it at 480 volts right to the loads. Unit assembly of Pyranol transformer, drawout air breakers, current transformers, and buses.

MONTHS SAVED BY ORDERING STANDARD EQUIPMENTS

STANDARD G-E load-center power units were ordered for this war plant soon after construction started. A simple one-line diagram like that at the left put our factory right to work. Metal-clad switchgear and unit substations were installed in *one-fourth* the time needed for non-standard, piecemeal assemblies. They were received at the job when needed—all ready to be set in place and connected.

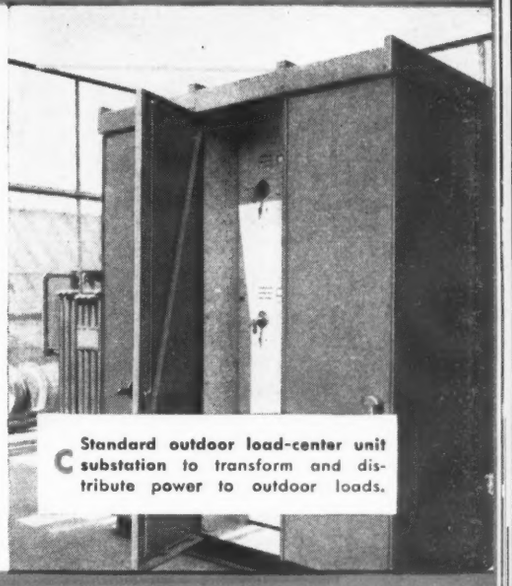
On this page are views of a few of these standard equipments—installed. They are typical of G-E load-center equipments that are being installed quickly and easily in plants everywhere. Note the metal-enclosed construction that safeguards workmen and production.

SAVED 145 TONS OF COPPER WITH LOAD-CENTER POWER DISTRIBUTION

ENGINEERS for this new war plant saved 145 tons of cable copper by taking high-voltage power right to the load centers, as shown at the left. In addition, they got a power distribution system that was so safe and efficient that, when need for additional capacity suddenly arose, they ordered another, a *duplicate* system—and saved another 145 tons of copper.

What's more, it took less copper to *build* these standard metal-clad units. The switchgear equipments shown at the top of this page took but 47 pounds of copper each. An open-type, piece-meal assembly would have taken more than four times as much.

If you need electric power for a new, enlarged, or converted war plant, we know you'll be pleased to learn how much copper and other critical materials you can save by using these standard load-center equipments. You'll find, too, that you can get them on the job quickly, and obtain a new high degree of safety and operating dependability. The nearest G-E office is ready to help you. *General Electric, Schenectady, New York.*



C Standard outdoor load-center unit substation to transform and distribute power to outdoor loads.

GENERAL ELECTRIC

854-19-7800

Get the top price for your Monel and rolled Nickel scrap

Segregate and avoid contamination

THE U. S. war industry is today in urgent need of Monel and rolled Nickel scrap.

Every pound you turn in is of real and immediate aid. And every such pound of scrap that is not contaminated with other metals, that is free of oil and dirt and properly segregated will return a higher price per pound to you.

When sent with proper authority direct to the Huntington Works of The International Nickel Company, Monel and rolled Nickel scrap is remelted into the form of pig. This is used, by the steel industry, in the making of important alloy steels.

Remember your effort in this scrap drive is not only a fine contribution to victory, it can pay you a substantial cash dividend.

The table and notes at right will help you in the sorting and identification of scrap metals.

QUALITATIVE TESTS FOR IDENTIFYING SOME COMMON WHITE METALS AND ALLOYS

MAGNETIC TEST	NITRIC ACID TEST			Iron Nail Test for Copper	Material Probably is
Reaction to Magnet	Reaction to Conc. Acid	Reaction to Acid after Dilution	Color of the Solution		
Magnetic	Reacts Slowly	Reacts Slowly	Pale Green	No Copper Plates out	Rolled Nickel
Magnetic* (slightly)	Reacts	Reacts Slowly	Greenish Blue	Copper Plates out	Monel
Non-magnetic	Reacts	Reacts	Bluish Green	Copper Plates out	Copper-Nickel Alloy containing less than 60% Nickel, e.g. Nickel-Silver
Magnetic	Reacts Slowly	Reacts	Brown to Black	Not required	Steel or Cast Iron
Non-magnetic	Reacts Slowly	Reacts	Brown to Black	Not required	Ni-Resist
Magnetic	No Reaction	No Reaction	Colorless	Not required	Straight Chromium Stainless Steel
Non-magnetic†	No Reaction	No Reaction	Colorless	Not required	Chromium-Nickel Stainless Steels e.g. "18-8"

*Monel is usually but not always slightly magnetic at atmospheric temperature. Monel that appears to be non-magnetic at atmospheric temperature may become magnetic when cooled by dipping in ice water or in a freezing mixture—other copper-nickel alloys of lower nickel content do not become magnetic. Monel that is magnetic at atmospheric temperature loses its magnetism when heated by dipping in boiling water. This test serves to identify Monel when only a magnet is available—no other common material loses its magnetism in this temperature range.

†"K" Monel is always non-magnetic even when cooled; therefore chemical analysis is required to distinguish "K" Monel from the copper-nickel alloys of lower nickel content.

NOTES ON CARRYING OUT TESTS

1. Magnetic Tests

Bring the magnet in contact with the specimen to be tested. (Be sure that there is no magnetic material such as iron or steel beneath or in the immediate vicinity of the specimen.) The magnet will or will not be attracted to the specimen.

In cases of doubt, and especially where the material appears to be non-magnetic, use a more sensitive testing method:

(a) Balance the magnet or the specimen on the edge of a bench or desk. Then bring the specimen close to the magnet, or vice versa. If the material is magnetic the balance will be upset and a movement of either the magnet or the specimen will be observed.

(b) Another method is to suspend the magnet on a string and bring it close to the specimen. A slight movement of the magnet will be observed if the specimen is even slightly magnetic.

2. Nitric Acid Tests

Clean test surface so that the acid will come into direct contact with the material.

Apply one or two drops of concentrated nitric acid to the clean metal surface.

Let acid remain in contact with the metal for a minute or two.

Observe any reaction that takes place.

Dilute acid by adding three or four drops of water, one drop at a time.

Observe reaction: If solution turns green or blue do not disturb until nail test has been completed.

3. Copper Test with Iron Nail

If nitric acid test forms green or blue colored solution, make test for copper:

Rub a clean iron nail in the colored acid solution on metal surface, keeping nail in contact with the specimen.

If the alloy contains copper, there will be a deposition of copper either on the nail or on the surface of the metal under the acid solution.

Add a drop or two of additional water as the nail is rubbed around to prevent the deposited copper from re-dissolving in the acid.

IMPORTANT!

No Monel and rolled Nickel scrap should be sent to Huntington without authorization.

Authorization must be obtained from the Scrap Salvage Section, Monel and Rolled Nickel Sales Department, The International Nickel Company, Inc., 67 Wall Street, New York, N. Y.

Letters requesting authorization should state:

1. Kind of metal (Monel or Rolled Nickel)

2. The amount

3. Type of scrap—turnings, forgings, castings, strip, sheet, etc.

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street **New York, N. Y**

SHAW PREFABRICATED PIPING

GEARED

TO 100% WARTIME PRODUCTION

The fast construction schedules being met in the building and expansion of essential ordnance, synthetic rubber and 100% octane aviation gasoline plants are a tribute to American industry.

The Shaw Company is proud of the part is has played and is playing in a number of these vital war projects. This part is the speedy, efficient prefabrication and installation of essential process piping . . . it typifies this company's ability to handle every type of piping job regardless of its size or character.

Herbert K. Wiehe

Manager, Construction Dept.

BENJAMIN F. SHAW CO

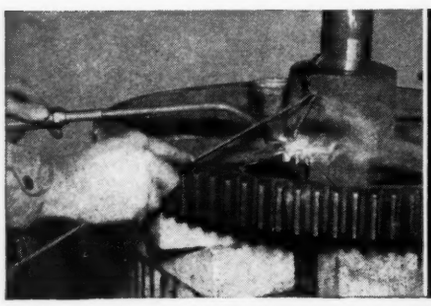
2nd & Lombard Streets, Wilmington, Delaware

Piping Fabricators, Contractors and Distributors

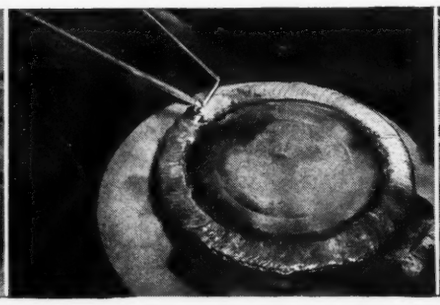
Products and Services for every Application of the OXY-ACETYLENE Process

MARITIME "M" AWARD FOR OUTSTANDING PRODUCTION ACHIEVEMENT

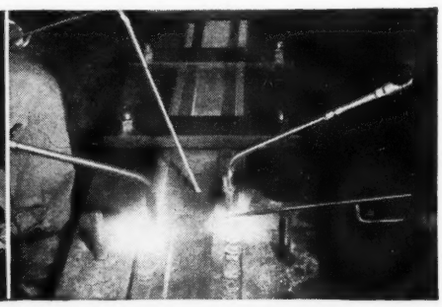
Oxy-acetylene processes are used throughout industry to speed up production and construction programs, to conserve materials, to lower operating costs, and to simplify problems of maintenance and repair. Some of the many oxy-acetylene applications are outlined here.



Bronze-Welding



Resurfacing

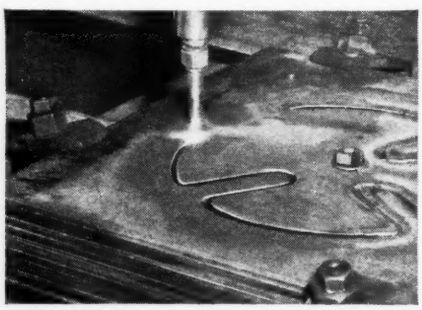


Hard-Facing

The oxy-acetylene flame makes possible the joining of practically any metals—like or unlike—so that the weld is as strong as the base metal itself. *Bronze-welding* speeds the repair of cracked or broken steel and iron parts right on the job. *Resurfacing* of worn parts with steel, iron, bronze, or other types of welding rod avoids delays and conserves materials. *Hard-facing* with Haynes Stellite alloys makes parts that are subject to abrasion, heat, or corrosion last from two to twenty-five times longer. Welded piping systems use less fittings, occupy less space, and remain leakproof and maintenance-free indefinitely.

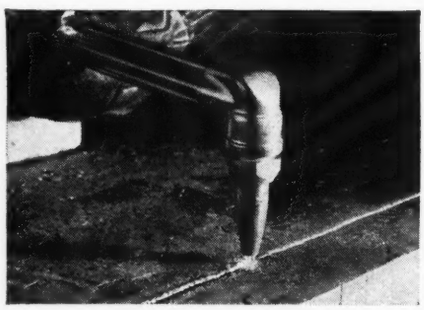
Machine Shape-Cutting

Shape-cutting quickly produces simple or intricate steel shapes with clean-cut edges. This method is also used for bar and billet cut-off, for straight-line cutting, and for preparation of plate edges.



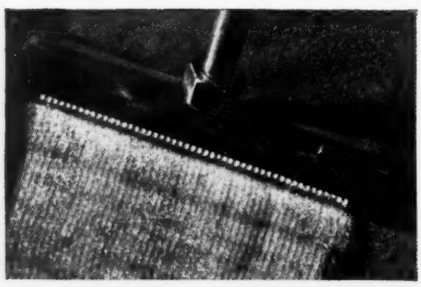
Stack-Cutting

Stack-cutting of tightly clamped piles of plates permits fast production of identical parts. This oxy-acetylene method usually is faster and more economical than shearing or other mechanical methods.



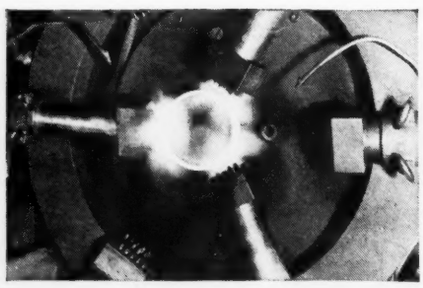
Hand-Cutting

Hand-cutting speeds the cutting of structural steel to length, quickly severs gates and risers and facilitates alteration work. With Oxweld gouging nozzles, a groove of surface metal can be removed.



Flame-Priming

This relatively new process removes loose scale, rust, and surface moisture from steel prior to painting — making paint go on faster, bond tighter and last longer.

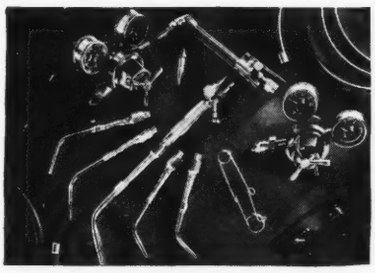


Flame-Hardening

This oxy-acetylene process is used to impart a hard, wear-resistant case to steel and iron parts without affecting the toughness of the core or chemical composition of the metal.

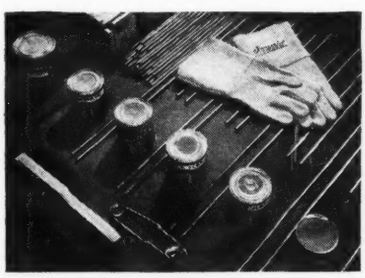
Heating

Heating for bending, straightening, and forming operations is facilitated by the intensely hot, easily controlled oxy-acetylene flame. Above a pipe is being wrinkle-bent.



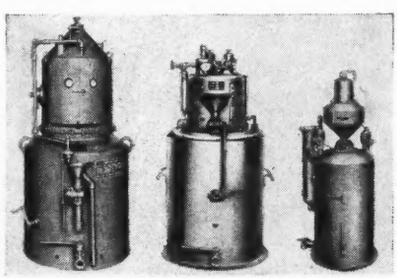
Hand Apparatus

Oxy-acetylene apparatus which may be ordered from Linde includes oxy-acetylene blowpipes for all welding and heating work; oxy-acetylene cutting blowpipes, cutting attachments, and nozzles; and oxy-acetylene descaling and flame-priming equipment. Oxweld apparatus is supplied from Linde offices and warehouses. The Purox and Prest-O-Weld line are distributed by industrial and automotive jobbers. Prest-O-Lite air-acetylene appliances for soldering and brazing are also distributed by these jobbers.



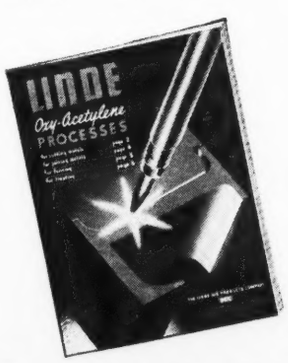
Welding Rods, Fluxes, and Supplies

Oxweld welding rods and fluxes are of exceptionally high quality. The many kinds and sizes of Oxweld rods make it possible to select the one that will give best results on each job. The Oxweld line also includes gloves, goggles, lighters, hose, ferrules, and asbestos paper. Rods, fluxes, and supplies may be ordered from Linde, or from automotive and industrial jobbers.



Generators and Manifolds

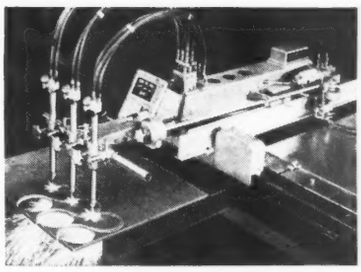
Oxweld acetylene generators produce low-cost acetylene and are made for both portable and stationary use—with maximum generating capacities of from 30 to 6,000 cu. ft. per hour. Oxweld oxygen and acetylene manifolds are used for centralizing the oxygen and acetylene supply from cylinders.



Send for This Catalog

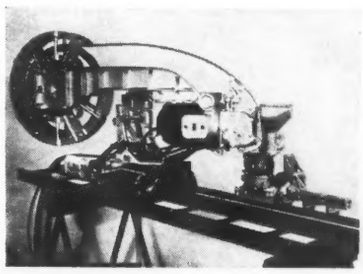
For a more detailed description of Linde processes and services, send for the booklet shown here. Catalogs describing oxy-acetylene generators, manifolds, hand and machine-cutting apparatus, Oxweld welding rods, fluxes, and supplies, also are available upon request. Specify the type of product in which you are interested.

Machine Apparatus



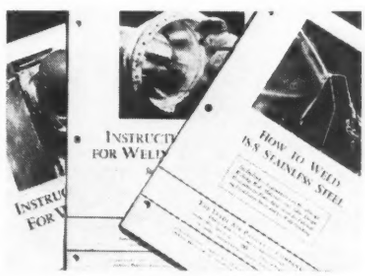
Included in the complete line of Oxweld apparatus are portable and stationary oxy-acetylene shape-cutting machines; straight-line cutting machines; flame-hardening apparatus; bar and billet cut-off machines; equipment for automatic welding; and tractor units for plate-edge preparation.

Unionmelt Welding



This unique electric process makes high-quality welds in any commercially used thickness of steel — in one pass—at high speeds — and without flash, glare, or sparks. The process is fully automatic. Speed and current values are established by electric controls adjusted by an operator. This process is used extensively in fabricating such equipment as ships, pressure vessels, locomotives, and pipe.

Process Literature



Linde makes available to customers a library of process literature which contributes to the knowledge of operators and shows how to use the oxy-acetylene process profitably.

Oxygen—Acetylene—Carbide

Linde oxygen, Prest-O-Lite acetylene, and Union Carbide are distributed through Linde plants and warehouses located to assure dependable deliveries and low transportation costs.

The words "Linde," "Prest-O-Lite," "Union," "Oxweld," "Purox," "Prest-O-Weld," "Haynes Stellite," and "Unionmelt" are trade-marks.

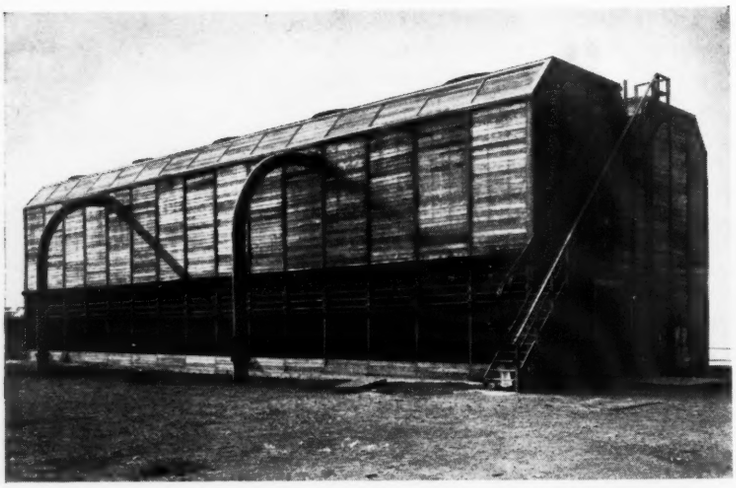
THE LINDE AIR PRODUCTS COMPANY

Unit of Union Carbide and Carbon Corporation

30 E. 42nd St., New York, N. Y. UCC Offices in Principal Cities

In Canada: Dominion Oxygen Company, Limited, Toronto

Cooling Towers

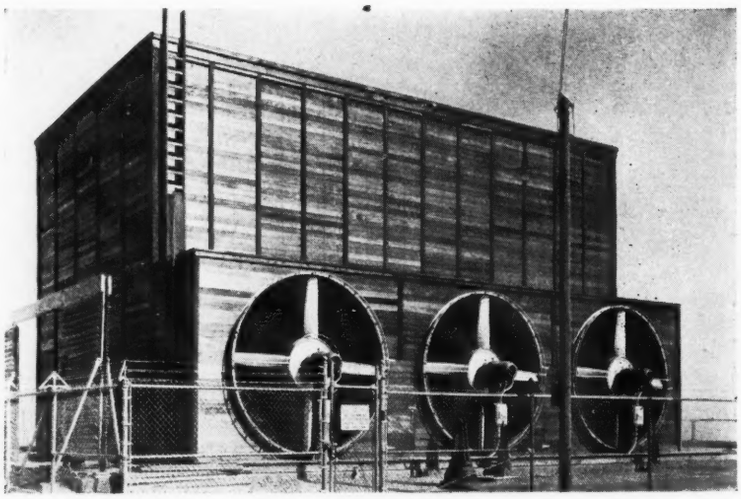


INDUCED DRAFT

Ten cell induced draft tower illustrates compactness of design achieved by arranging the cells in 2 rows of 5 each, placed back to back. This tower has a normal capacity of 11,250 gpm cooled from 111° to 81° F.

FORCED DRAFT

Three cell forced draft tower with three axial flow, four bladed fans 12′ in diameter. Tower is of usual Redwood construction—finest material in the world.



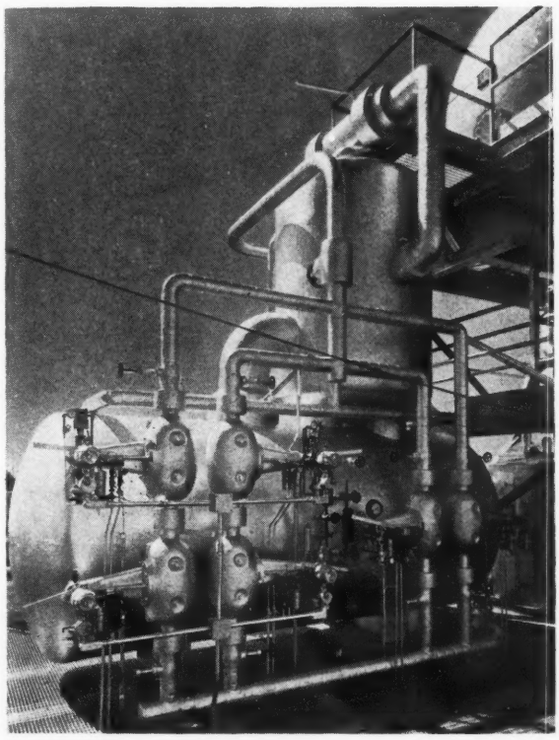
Advantage of Mechanical Draft Cooling Towers

1. Low construction costs
2. Flexibility of design to provide for varying load conditions
3. Low pumping head
4. Control of cooling capacity during all seasons regardless of climatic conditions.
5. Negligible maintenance expense
6. Minimum water loss through draft

FOSTER WHEELER CORPORATION

Power Plant Auxiliaries

AIR HEATERS
SUPERHEATERS
ECONOMIZERS
PULVERIZED FUEL SYSTEMS
CONDENSERS
EVAPORATORS
CENTRIFUGAL PUMPS
VACUUM PUMPS
HEAT EXCHANGERS

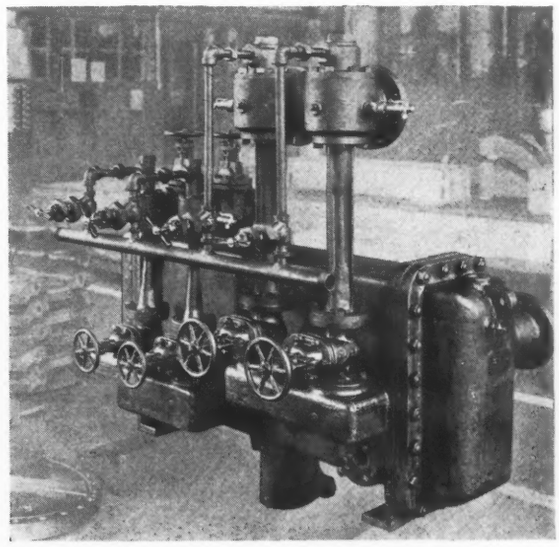


Open, low-pressure feedwater heater.

Direct contact and shell-and-tube type, feedwater heaters for all pressures and temperatures, Lockhead closures for pressures of 3200 lb. per square inch in service for several years—no bolts larger than 1½" are used. Multi-stage pumps for bleeder systems combine several stages on a single shaft.

EXPANSION JOINTS

Type "S", all-welded, stainless steel bellows, expansion joints built for standard pressure series, to 300 lb., sizes to 36"; temperature 750°F., special modifications for 1000°F. A 600 lb. series also available. Special joints up to 78" diameter in service.

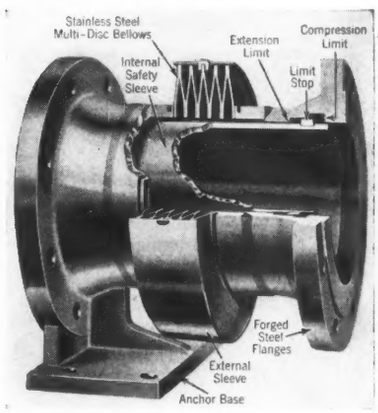


Representative steam air ejector, with twin elements and two stages and isolating valves.

STEAM JET AIR EJECTORS

Steam jet air ejectors for all conditions where vapors are evacuated at low pressures. Single-stage, two-stage, three-stage, and four-stage units available from moderate vacuum to 29.98 inches of mercury.

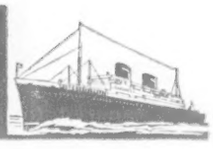
Isolating valves provided with multi-stage units thus permitting any element of ejector to be opened or removed completely for inspection or repair.



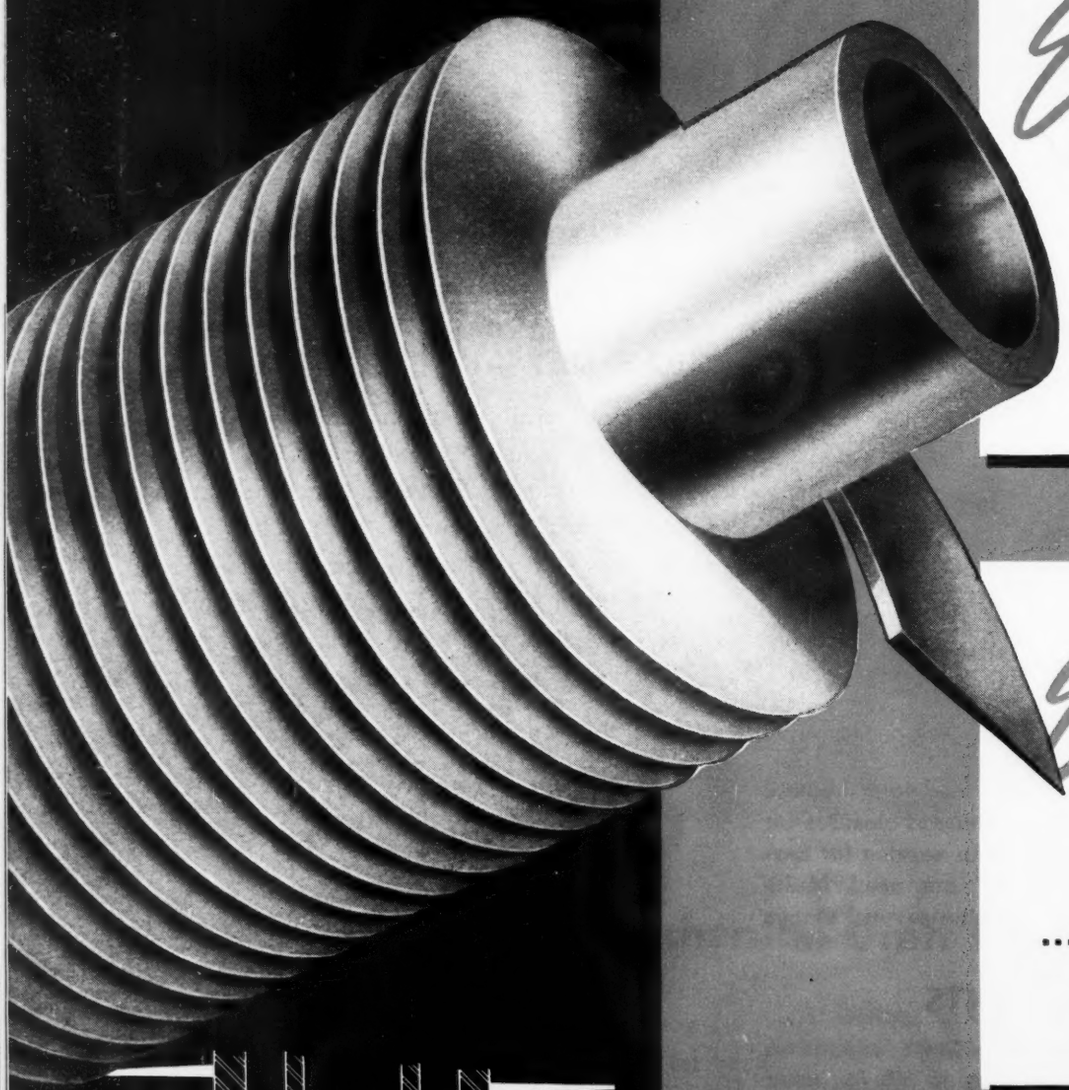
Typical, all-welded, packless, expansion joint.

165 BROADWAY, NEW YORK, N. Y.

WHEELER



New A Reliable



Exclusive

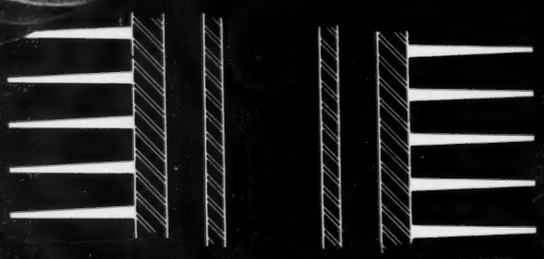
IT'S BUILT AROUND STANDARD STEEL PIPE

...The life and service of which is familiar to every one.

Exclusive

SMOOTH TAPERED FINS SPEED AIR FLOW

...Absence of Crimping Cuts Air Resistance and Dust Accumulation.



FAST-FLOW HEAT TRANSFER

Cross-section illustrates the Sturtevant smooth, tapered fins, secret of the high performance of this new Sturtevant all-steel extended surface. Notice how the fin is shaped to promote equal heat intensity at every point along its section. No crimping to collect dust or impede airflow.

SINGLE-TUBE INTERNAL TUBE CONSTRUCTION FOR HEAVY DUTY

A time-tested form of construction which has given dependable performance for a quarter of a century.

Steel Heater!

STURTEVANT HEAVY-DUTY ALL-STEEL HEATER

—especially suitable for industrial high temperature applications!

It's the result of 3 years' research on steel heating coils. NOT a substitute for shortages—but a radical improvement in extended surface design for *NOW* —and *After the War!*

Featuring standard steel pipe construction to withstand severest services – smooth fins to minimize air flow resistance – tapered fins for fast-flow heat transfer.

FULLY GUARANTEED!

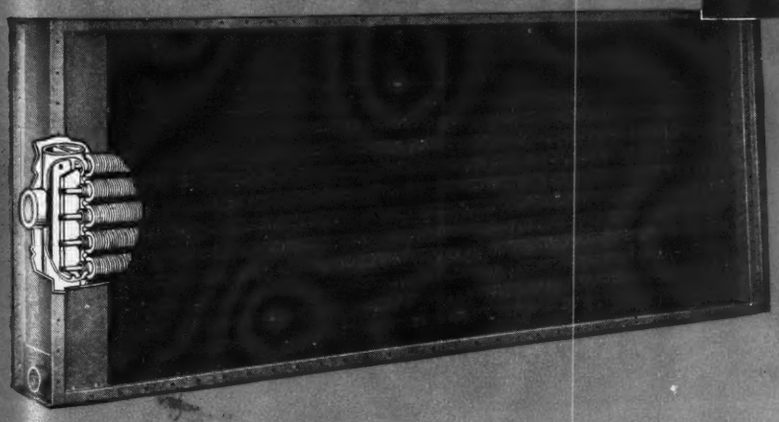
Now, for all heating and drying work, there is no reason to risk early and frequent replacement. Instead, this Sturtevant heavy-duty steel extended surface gives you all the advantages of encased heater sections, is as reliable as the old Sturtevant Pipe Coil Heater, many of which are still in service after more than 50 years of satisfactory operation, and carries the same guarantee which is customary on copper units.

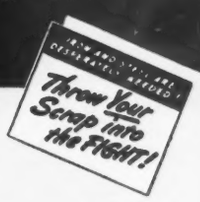
Overcomes many troubles that occur at higher steam temperatures

Need for a heavy-duty all steel surface has always been evident in certain installations where conditions caused corrosion of copper. Here's how the new Sturtevant heavy duty heater licks this problem: Steam is carried in standard steel pipe from the time it enters the heater until it goes back into the condensate line; the unit is as durable as the supply and return lines themselves.

And there are plenty more reasons why this latest Sturtevant development makes front page news in industry;—1, it utilizes a proved principle known as Internal Tube Construction—used by Sturtevant for 25 years; 2, it can be installed either vertically or horizontally, header required only on one end; 3, made in the same standard sizes as copper units—hence requires no more space. Performance and dimension data available on request.

Sturtevant
REG. U.S. PAT. OFF.
Puts Air to Work





P-12-42

B. F. STURTEVANT CO.
Hyde Park, Boston, Mass.

I am interested in the new Sturtevant All Steel Heater for the following essential applications_____

_____

Please send further information to:

Name_____ Title_____

Company_____

Address_____

OUR ALL-OUT WAR EFFORT

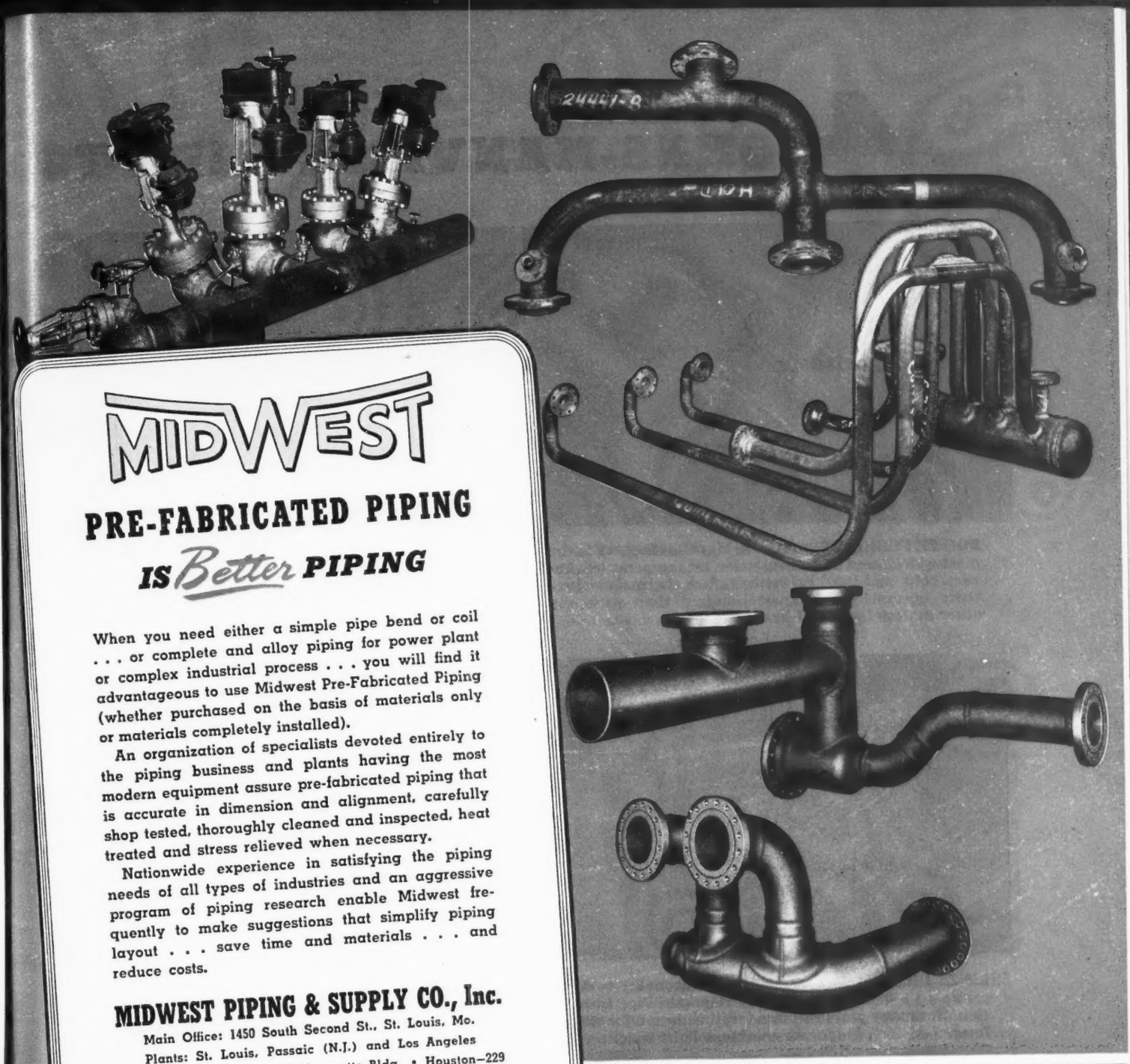
calls for top-speed production without frequent interruptions for re-packing and for replacing gaskets.

The dependability of all Garlock products is helping industry maintain Vital, non-stop, smooth-running production.

GARLOCK

THE GARLOCK PACKING COMPANY, PALMYRA, N. Y.

In Canada: The Garlock Packing Company of Canada Limited, Montreal, Que.



MIDWEST

PRE-FABRICATED PIPING

IS Better PIPING

When you need either a simple pipe bend or coil . . . or complete and alloy piping for power plant or complex industrial process . . . you will find it advantageous to use Midwest Pre-Fabricated Piping (whether purchased on the basis of materials only or materials completely installed).

An organization of specialists devoted entirely to the piping business and plants having the most modern equipment assure pre-fabricated piping that is accurate in dimension and alignment, carefully shop tested, thoroughly cleaned and inspected, heat treated and stress relieved when necessary.

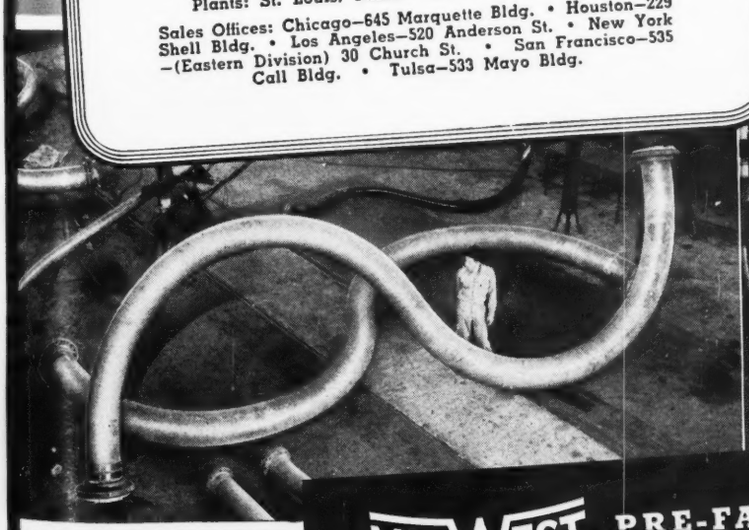
Nationwide experience in satisfying the piping needs of all types of industries and an aggressive program of piping research enable Midwest frequently to make suggestions that simplify piping layout . . . save time and materials . . . and reduce costs.

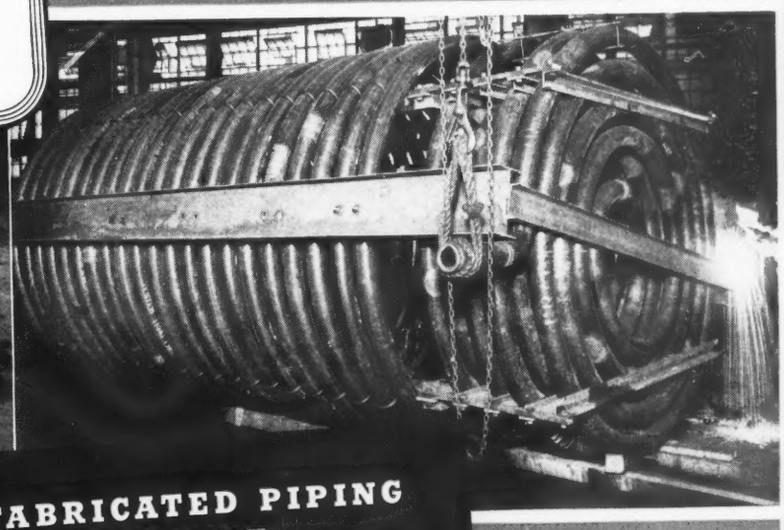
MIDWEST PIPING & SUPPLY CO., Inc.

Main Office: 1450 South Second St., St. Louis, Mo.

Plants: St. Louis, Passaic (N.J.) and Los Angeles

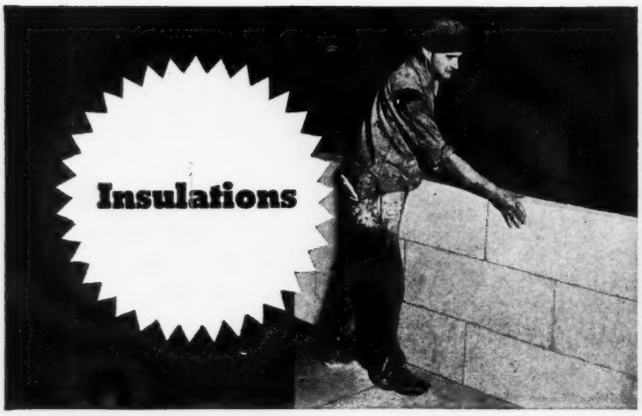
Sales Offices: Chicago—645 Marquette Bldg. • Houston—229 Shell Bldg. • Los Angeles—520 Anderson St. • New York —(Eastern Division) 30 Church St. • San Francisco—535 Call Bldg. • Tulsa—533 Mayo Bldg.



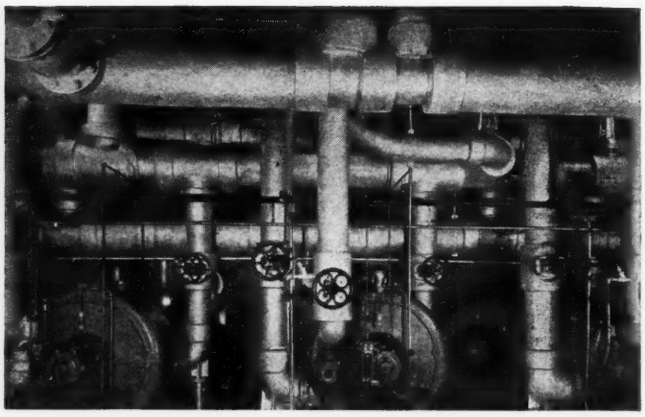


MIDWEST PRE-FABRICATED PIPING *COMPLIES WITH BOTH* ASA CODE FOR PRESSURE PIPING *and* ASME BOILER CONSTRUCTION CODE

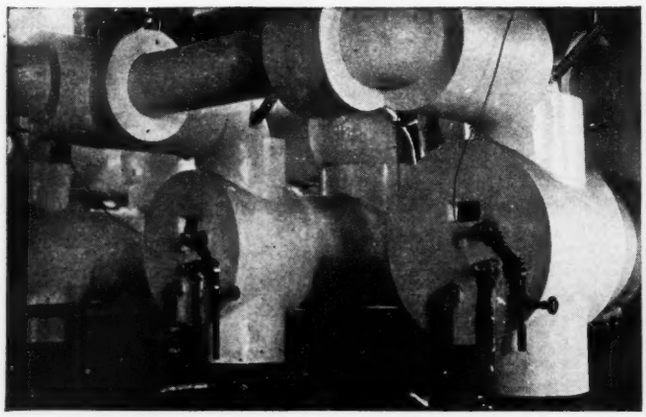
4 JOHNS-MANVILLE AIDS TO



BOILER FURNACES . . . Johns-Manville Superex is the most widely used block insulation for temperatures between 600° and 1900° Fahrenheit. Low thermal conductivity means less thickness required than with any other material of equal heat resistance.

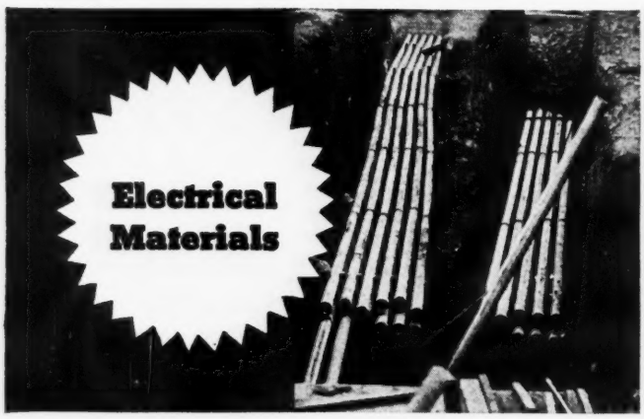


SUPERHEATED STEAM LINES . . . For maximum fuel conservation, Johns-Manville Superex Combination Insulation is recommended. Built up of Superex and J-M 85% Magnesia, it has unusually high insulating value and exceptional heat resistance.

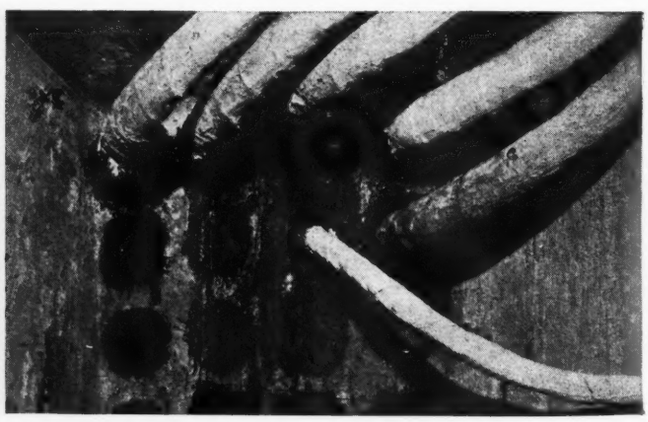


LINES UNDER 600° . . . For greatest economy in service up to 600° F., use J-M 85% Magnesia Pipe Insulation. For many years the standard insulation for steam lines, J-M 85% Magnesia combines light weight with high insulating efficiency.

LOW TEMPERATURES . . . J-M Rock Cork Sheets and Pipe Insulation are recommended for cold storage construction and refrigerating equipment. J-M Rock Cork does not rot or decay. Unusually moisture-resistant, it assures permanently high insulating efficiency.

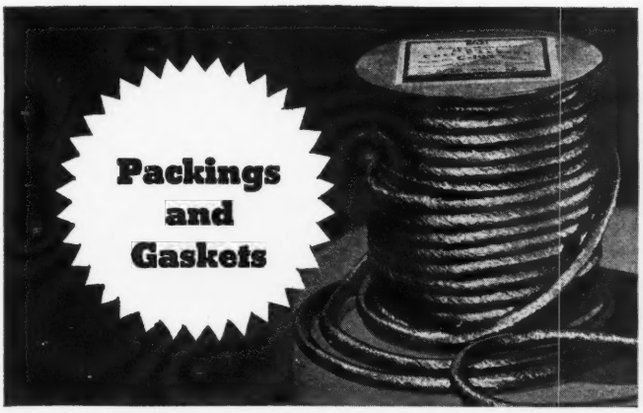


TRANSITE CONDUIT AND KORDUCT . . . Two types of electrical conduit provide lower installation cost and reduced maintenance expense. Other J-M electrical materials include Asbestos Ebony, Trancell, Cable Fireproofing, Friction Tapes, Splicing Compounds.

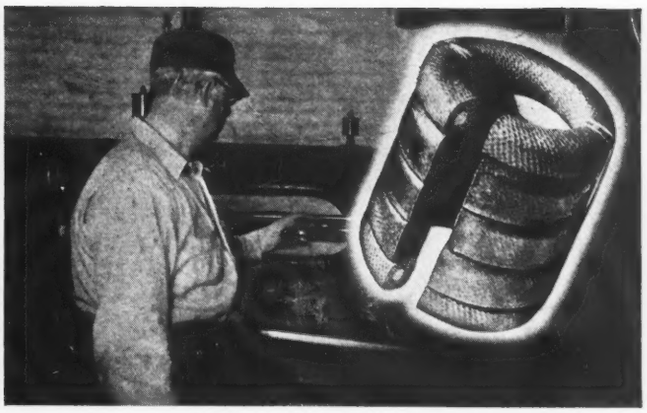


SEALING COMPOUND . . . J-M Duxseal is a non-hardening adhesive plastic compound with an asbestos base. Duxseal adheres tightly to duct walls and cables, won't slump or harden in service, and it is insoluble in water and unaffected by ordinary gases and condensates.

POWER PLANT CONSERVATION

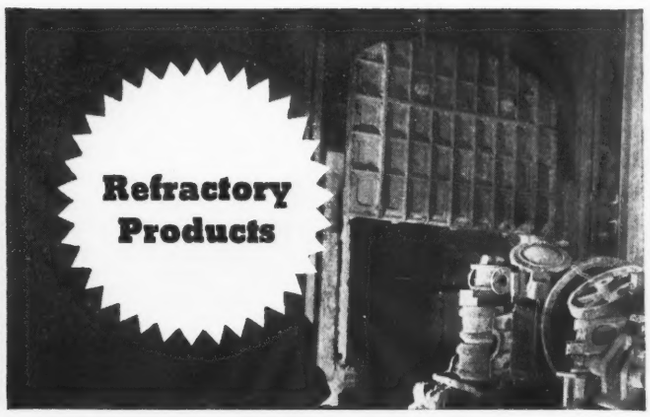


GENERAL UTILITY ROD AND VALVE STEM . . . Unusually adaptable, J-M Mogul Packing may be used for a wide variety of services. Soft and pliable at the start, it stays that way . . . does not wilt under sustained heat. Available twisted, and braided—round and square.



AGAINST STEAM, AIR, BRINE, OIL . . . J-M Sea Rings provide a minimum of friction on rods and plungers. They automatically seal on the work stroke, and release on the return stroke . . . thus reducing friction, minimizing rod wear, and conserving power.

MOULDED PACKING PRODUCTS . . . J-M Packing Cups, Seal Rings and other moulded packings are made to the exact shape and size required. They are made from materials proved by long experience to be most satisfactory in the service for which they will be used.



DOOR LININGS, SPECIAL SHAPES . . . Shapes can be cast, quickly and easily . . . and ready for service within 24 hours . . . by use of J-M Firecrete Castable Refractories. Ideal for poured door linings. 3 types: Standard (2400°), High Temp. (2800°), Light Weight (2200°).

Specialists in Conservation for 84 Years

Today, more than ever, power plant conservation is important—indeed, it is essential to the welfare of the nation. J-M brings you the knowledge accumulated during 84 years of experience . . . to help you avoid waste, save fuel, and cut costs.

In power plants all over the country, J-M Power Products are today contributing to the war effort, and will tomorrow be available for the resumption of peacetime activities.

For complete details on any or all of the products described here, write for Catalog GI-6A, Johns-Manville, 22 East 40th St., New York, N. Y.

JOHNS-MANVILLE
JM
PRODUCTS

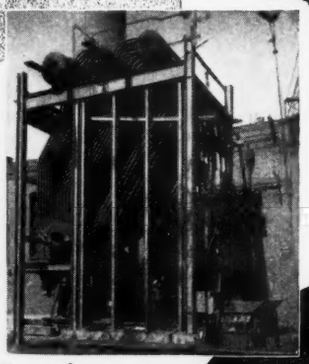
JOHNS-MANVILLE POWER PRODUCTS

Vogt PRODUCTS ARE

★ DESIGNED to RAISE
★ OPERATING STANDARDS and
★ LOWER YOUR COSTS

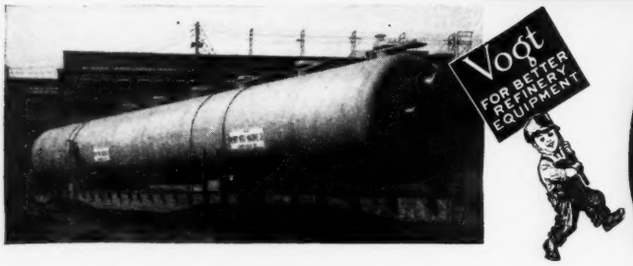
Drop Forged for Safety and Economy under the Most Trying Conditions

Valves, Fittings and Flanges by Vogt—the choice of operating men everywhere for safe and sure regulation of the high pressure and high temperature liquids and gases used in modern process work.



High Operating Efficiencies and Low Maintenance Costs

More steam per dollar of investment—because Vogt steam generating equipment is designed and built to fit in with specific operating conditions. Vogt boilers are available in bent tube types and straight tube, forged steel sectional header types for solid, liquid, or gaseous fuels, as desired. Three-drum types can be supplied to fit any conditions of restricted installation space.



Meeting the Demands for Operating Security

Vogt has every facility for the fabrication of stills, towers, continuous rotary filters, filter presses, oil chilling machines, heat exchangers, etc., and these products are serving the petroleum industry around the world.

Vogt PRODUCTS

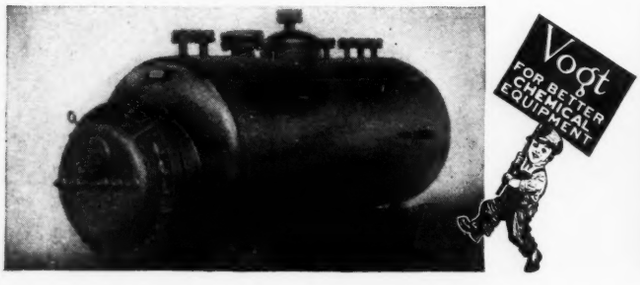
For Oil Refineries, Chemical Plants, Power Plants and Related Industries

☆

HENRY VOGT MACHINE CO.

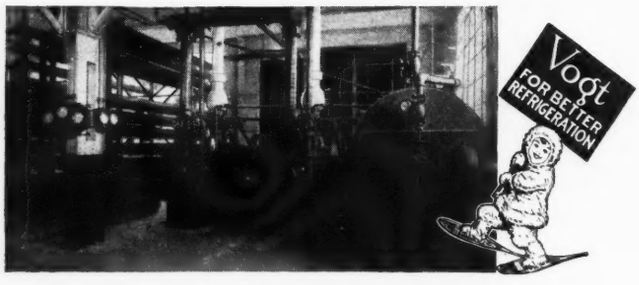
LOUISVILLE, KENTUCKY

NEW YORK • PHILADELPHIA • CLEVELAND • CHICAGO • DALLAS



To Combat Corrosion and Product Contamination

Process equipment made from special metals and alloys for the exacting service of the chemical plant is fabricated in our modern shops for many of the well known chemical companies.



Steps Tonnage Up and Costs Down

Our experience of more than 50 years in building profit-making ice and refrigerating machinery is at your command. We make complete units for ice and cold storage plants, packing plants, dairies, breweries, chemical plants, oil refineries, etc.

WITH WHATEVER COAL YOU CAN GET?

War time shipping embargoes threaten to eliminate long haul shipments of "premium" coals, and force every plant to buy from the nearest mines regardless of its analysis. Some plants, when operating without "premium" coal doubtless will lose pressure. But plants equipped with Stowe Stokers will be able to continue operations at high rating and efficiency with whatever coals are available.

Due to their unique grate construction Stowe Stokers are not dependent upon any type or analysis of coal. They can burn the entire range of bituminous coals from 20% ash low fusing coal to 4% ash West Virginia coal,—all at high rating and high efficiency. Changes of coal can be made without taking the boilers off the line. Coal storage can be reduced.

Our recently completed catalog gives full details about Stowe Stokers—furnished in sizes from 300 H. P. upward—and contains much information of interest to every engineer and operating man . . . Send for a copy today.

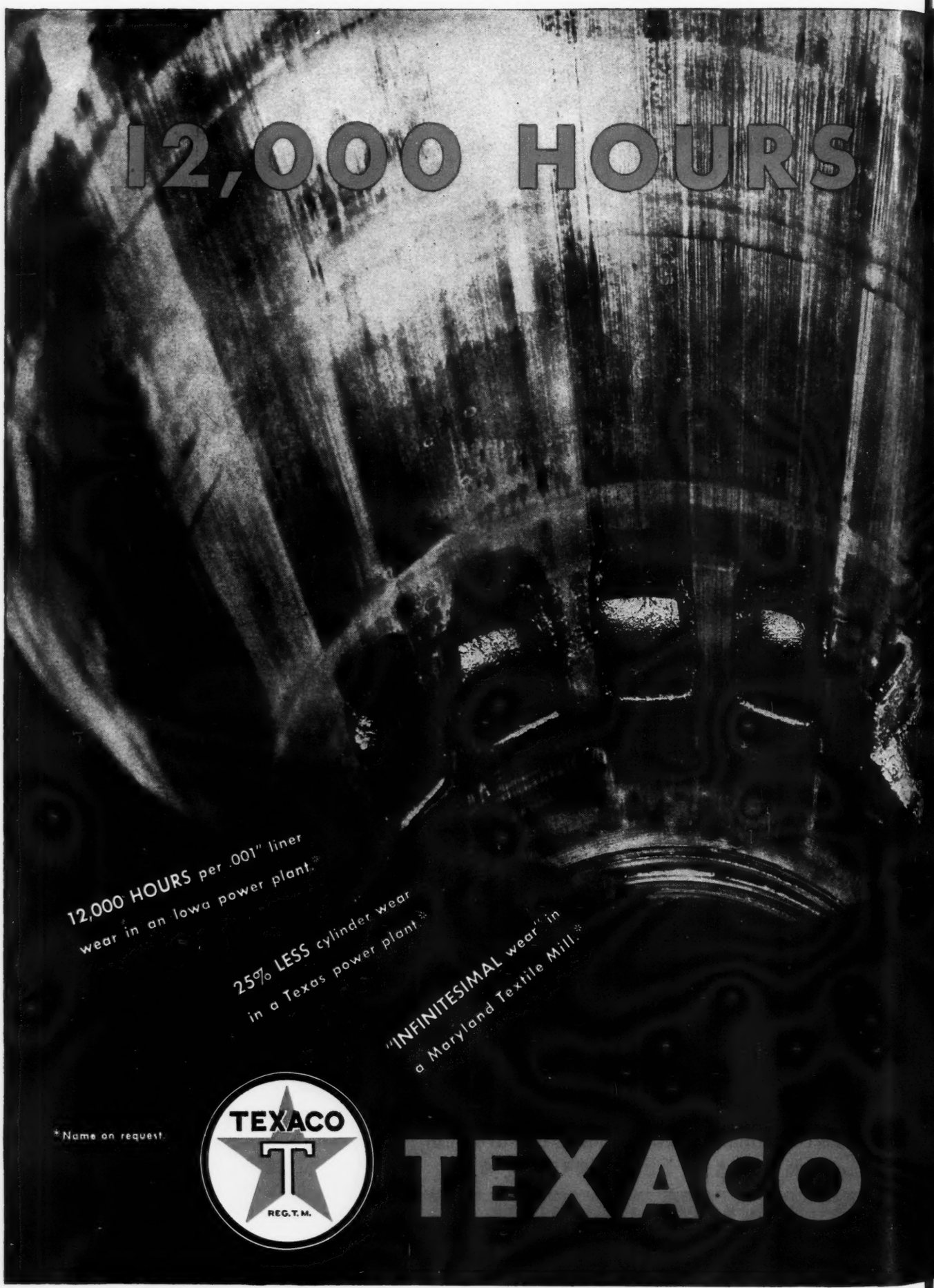
THE JOHNSTON & JENNINGS CO.

DETROIT — 878 Addison Road, CLEVELAND, OHIO — CHICAGO

Engineering and Sales Representatives in
New York • Pittsburgh • Kansas City • St. Louis

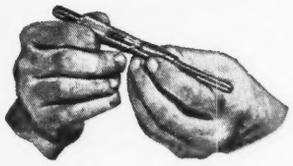
STOWE STOKER

NOT AN UNDERFEED NOT A CHAIN GRATE


12,000 HOURS
12,000 HOURS per .001" liner wear in an Iowa power plant.*
25% LESS cylinder wear in a Texas power plant.*
"INFINITESIMAL wear" in a Maryland Textile Mill.*
*Name on request.
TEXACO
REG. T. M.
TEXACO

TUNE IN FRED ALLEN EVERY SUNDAY NIGHT—CBS

PER .001" WEAR



FROM OPERATORS of Diesels large and small come reports of tremendously increased liner life, when using *Texaco Algol* or *Ursa Oils.*

In your Diesels, too, *Algol* or *Ursa Oil* will reduce wear on hard-to-replace parts, keep rings free in their grooves, valves active, ports clear, and assure piston seal that means full power and fuel economy.

Because of the benefits Texaco brings—

More stationary Diesel horsepower in the U. S. is lubricated with Texaco than with any other brand.

The outstanding performance that has made Texaco FIRST in the stationary Diesel field, has made it FIRST in the fields listed below.

These Texaco users enjoy many benefits that can also be yours. A Texaco Lubrication Engineer will gladly cooperate . . . just phone the nearest of more than 2300 Texaco distributing points in the 48 States, or write:

The Texas Company, 135 East 42nd St., New York, N.Y.

THEY PREFER TEXACO

★ More Diesel horsepower on streamlined trains in the U. S. is lubricated with Texaco than with all other brands combined.

★ More locomotives and cars in the U. S. are lubricated with Texaco than with any other brand.

★ More revenue airline miles in the U. S. are flown with Texaco than with any other brand.

★ More buses, more bus lines and more bus-miles are lubricated with Texaco than with any other brand.

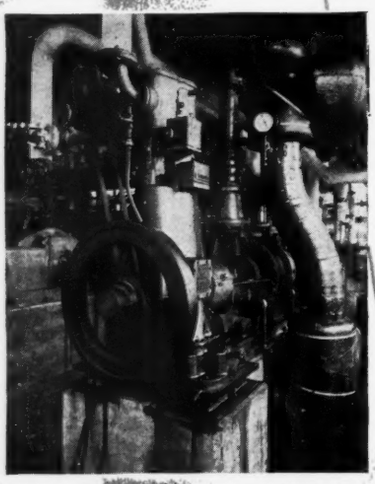
★ More stationary Diesel horsepower in the U. S. is lubricated with Texaco than with any other brand.

Lubricants and Fuels

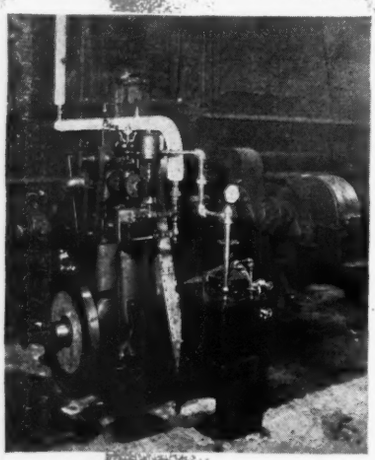
FOR ALL DIESEL ENGINES

HELP WIN THE WAR BY RETURNING EMPTY DRUMS PROMPTLY

Links in a Nation-Wide chain of TROY-ENGBERG BY-PRODUCT POWER

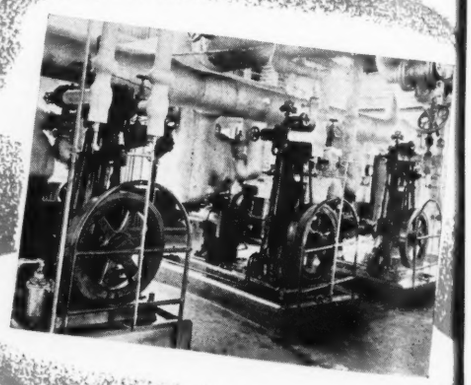


HUNDREDS of links have been forged in the making of this strong and durable chain—for in hundreds of plants you can find Troy-Engberg Steam Engines driving such power plant and processing equipment as: stokers, blowers, fans, generators, compressors, pumps, cookers, dryers and exhausters



Practically all of these are "by-product power" drives—the engines in effect serving as gigantic reducing valves; taking live steam from the boilers and delivering heat units in the exhaust for processing or heating. The power taken out of the steam by the engine is rightly called "by-product power".

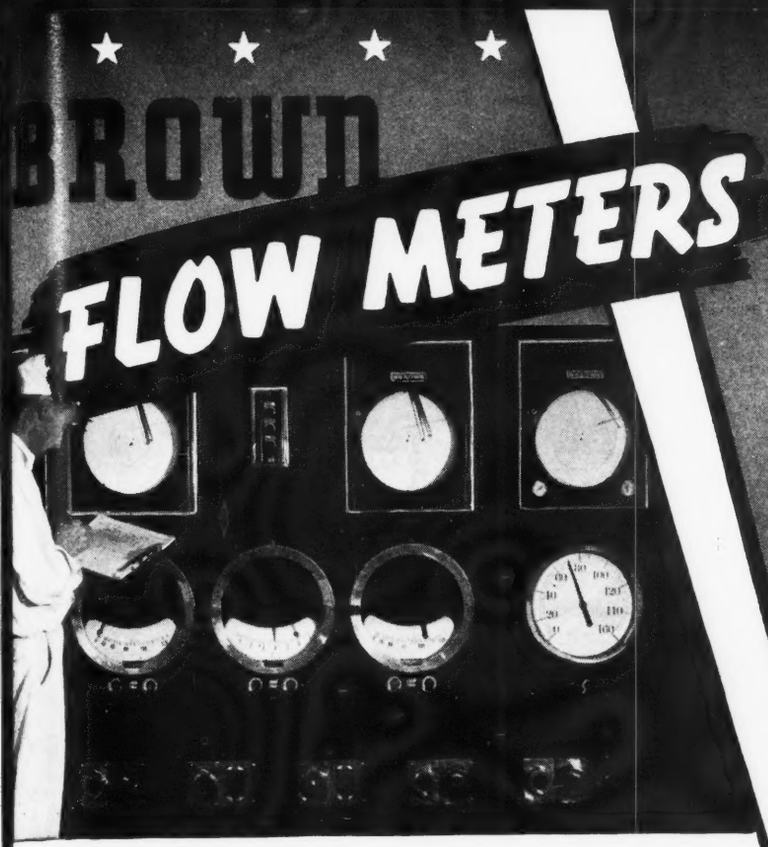
"By-product power" is usually much cheaper than purchased power, often so much cheaper that the entire cost of the engine is paid for in a few months or at the most, a year or two. Every plant with the need for steam for processing or heating should look into the merits of the Troy-Engberg Steam Engine as the replacement drive for those now in service and wearing out. It has much to offer.



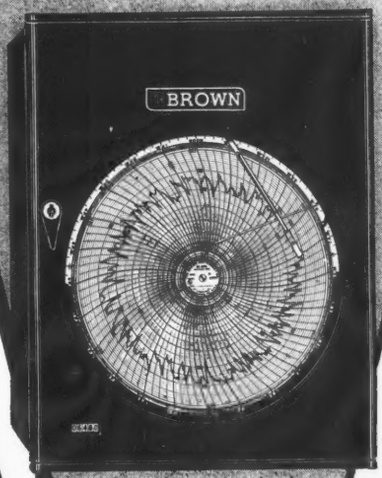
TROY ENGINE & MACHINE CO.

1483 Railroad Ave., Troy, Pa.

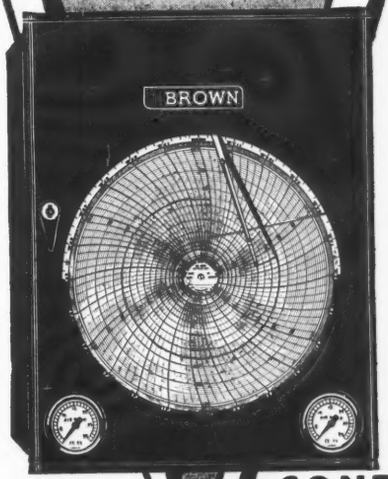
BROWN FLOW METERS ... SECURE EFFICIENT POWER PRODUCTION



INDICATING



RECORDING



CONTROLLING

TO win the war—It is a patriotic duty to *eliminate waste of power.*

To produce and use power more efficiently is the object of every industrial operation. For that purpose, good managers keep chart records of steam, air, oil, gas, water and other fluids.

Whether you buy steam or generate it in your own plant — every pound of steam saved — not only in the boiler room but in every department or unit where steam is used—assures Victory.

With Brown Flow Meters, you can correctly determine the cost of making steam for power, processing or heating and properly allocate costs to departments or units. Brown Flow Meter chart records show the rate of steam flow which enables operators to maintain the most efficient boiler operation, thus effecting substantial fuel savings.

An automatic planimeter pen record on rim of chart shows steam flow in volume units and the time at which it was produced or used in any part of the 24 hour period, and enables management to readily analyze steam production and distribution.

Thousands of plant engineers are getting this invaluable service from Brown Flow Meters. In many plants, the investment for Brown Indicating, Recording and Controlling Flow Meters has been repaid many times over. Write for catalogs.

For Temperatures . . . . . Pressures . . . . . Flows . . . . . Liquid Levels

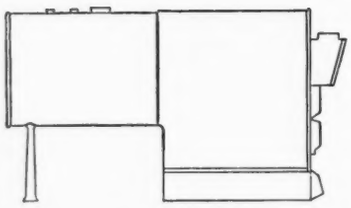
BROWN INSTRUMENTS

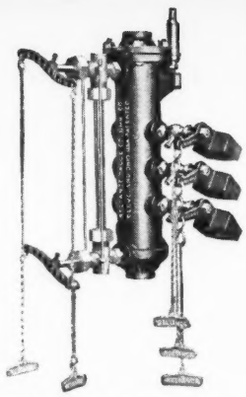
ELECTRIC • AIR OPERATED

THE BROWN INSTRUMENT COMPANY, 4490 WAYNE AVENUE, PHILADELPHIA, PENNSYLVANIA
DIVISION OF MINNEAPOLIS-HONEYWELL REGULATOR CO.
MINNEAPOLIS, MINNESOTA AND 119 PETER STREET, TORONTO, CANADA
Wadsworth Road, Perivale, Middlesex, England
Nybrokajen 7, Stockholm, Sweden

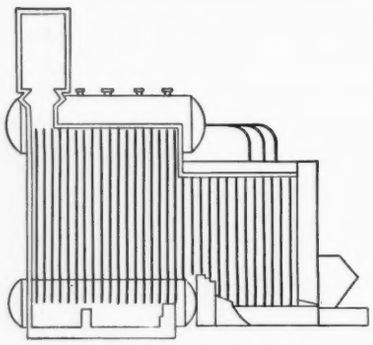
Reliance Boiler Alarms and for Surer,

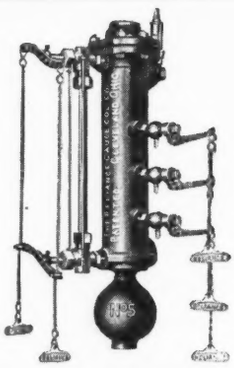
OF the equipment this war-season's well-dressed boiler wears, none is more important than the water column and water level gage. Reliance Alarm Water Columns, standard of the industry for 59 years, and the complete line of Reliance gage equipment are your assurance of safe, efficient handling of this vital function on any type of boiler.



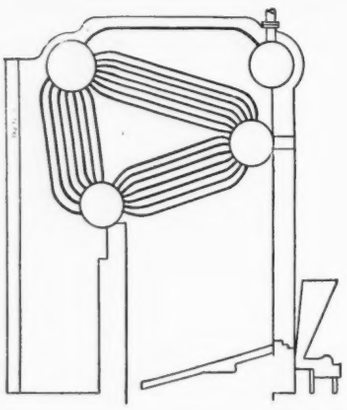


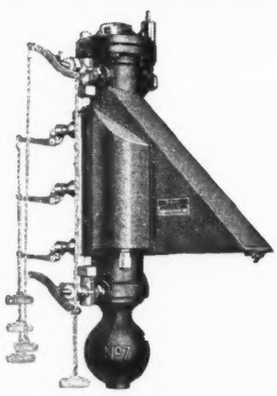
For HRT Boilers Reliance offers a selection of cast semi-steel Water Columns with high and low alarms or low alarm only. No. 14, illustrated, is typical. Steam connection is made into column cap; water connection can be made into bottom or side boss on column. Alarm signal on 6 inch variation of water level.





Moderate size water tube boilers can be protected from dangers of faulty water levels by one of several Reliance Alarm Water Columns designed for easy piping assembly. No. 5 Column, illustrated, provides alarms on 8 inch water level variation, at center of top and bottom gage cocks. The Reliance Tiltview, an inclined chain pull gage assembly, is often used to provide easy vision of water level from narrow firing aisle and to lessen the danger scalding in event of glass breakage.





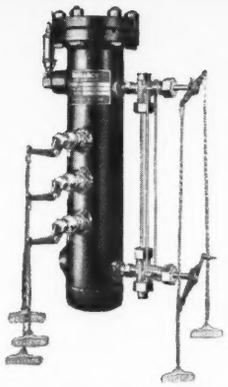
Large water tube boilers under 250 p. s. i. need a man-size water column properly to guard the water levels. No. 7 Reliance Column, illustrated, permits 12 inch variation of water level between alarms, so that swell from cold to full load need not create annoyance from the alarm signal. High-set steam generators make conventional gage difficult to read; to compensate for this, Reliance Prismatic (black and white reading) Gage Insert with Periscope and illumination for reflecting water level to eye-level mirror, provides safe convenient control.

Since 1884

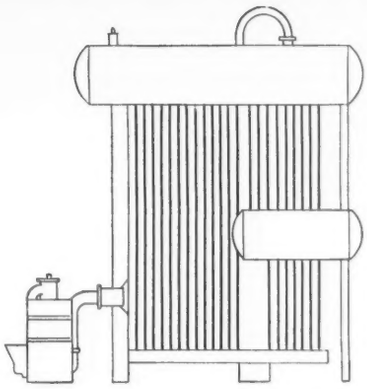
Reliance

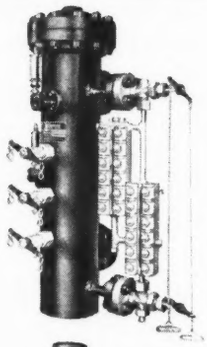
Water Column Equipment

Safer Control of Boiler Water Levels

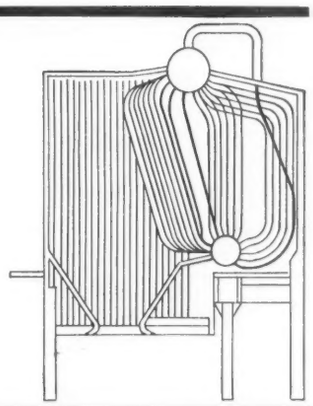


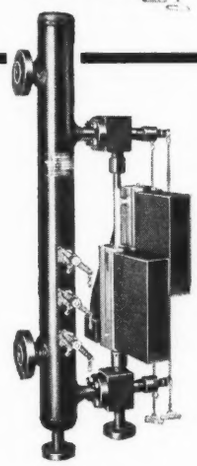
For boilers in the 250-350 p.s.i. group, of moderate capacity, No. W53 Reliance Alarm Column, illustrated, is appropriate. Alarms signal on 8 inch variation of water level, at center of top and bottom gage cocks. Standard piping brings water connection into side boss, steam connection into top cap. This column is of all forged steel construction with extra heavy bronze water gage and gage cock fittings. For mistake-proof water level reading, include Reliance Prismatic or Mica-Protected Flat Glass Insert, available in various visibility lengths.



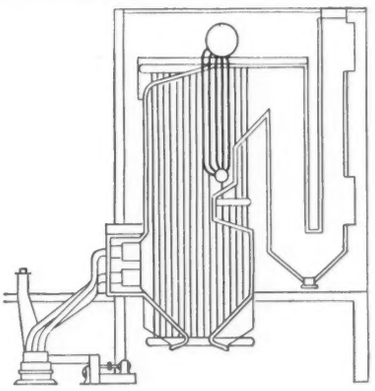


Steam generators from 350 to 900 p.s.i. are rightfully constructed to individual design, meeting the user's requirements. Reliance likewise tailors Alarm Water Column Equipment to suit such boilers. Forged steel construction with appropriate flanged connections is adapted from *standard and approved* design. Forged steel water gage valves, gage inserts and gage cocks are recommended. Each boiler should have in addition the Reliance EYE-HYE Remote Reading Water Level Indicator to share the responsibility of guarding vital water levels.





Super-steam generators demand super Water Columns such as this No. W2000 Reliance Column. The utmost in reliability is required to guard the water levels here. Reliance facilities permit a specialized product in every detail to meet the needs of the individual job. Any flange connection design, welding neck design, hanger lugs etc. may be had. Certified welding to A. S. M. E. specifications. Two water column assemblies are *recommended* on each boiler, plus Reliance EYE-HYE for accurate remote reading convenience; heavy duty gage valves and gage inserts — *but no gage cocks.*

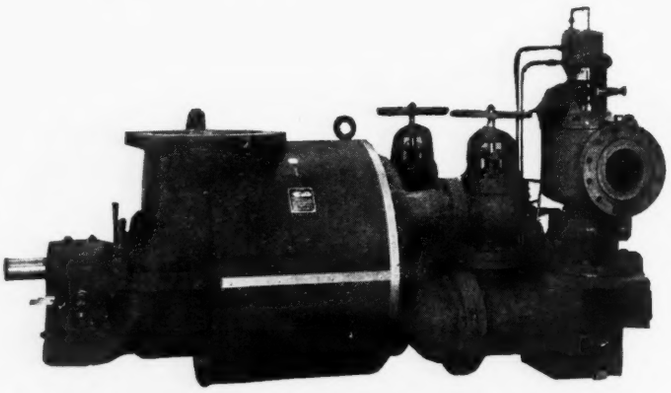


BOILER SAFETY DEVICES

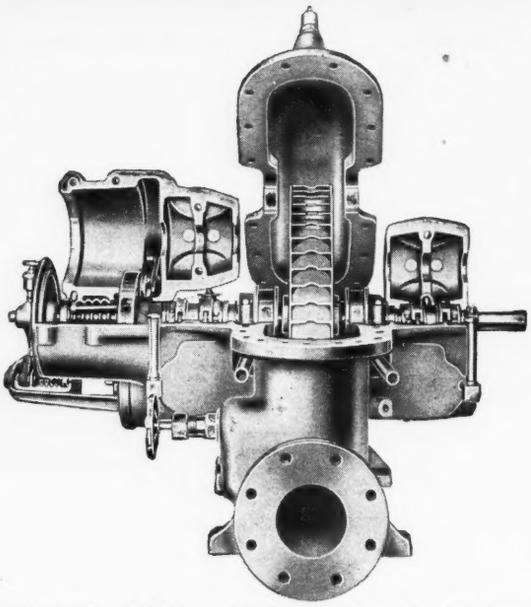
THE RELIANCE GAUGE COLUMN CO.
Cleveland, Ohio

TERRY

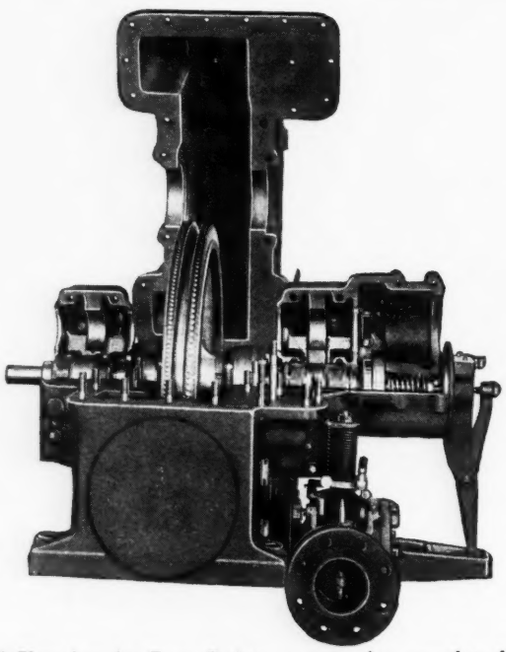
OFFERS COMPLETE COVERAGE OF MECHANICAL DRIVE TURBINES



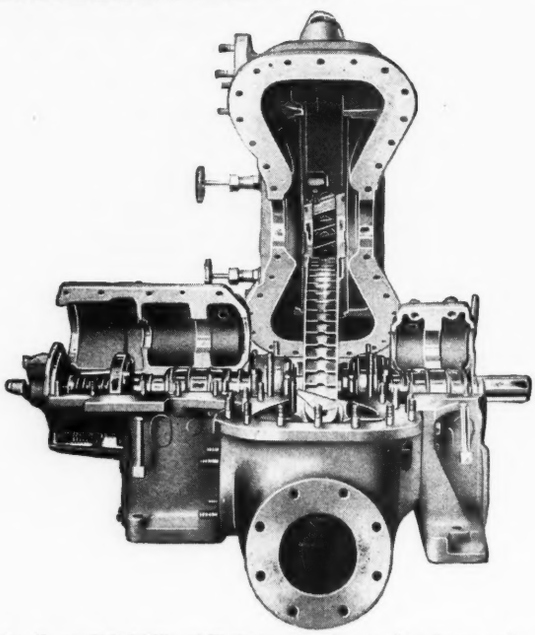
1200 Horsepower Terry Multi-stage Turbine. Units of this type are employed extensively for driving large pumps. The units may be designed for non-condensing, condensing, mixed pressure, or bleeder operation. They may be equipped with constant speed or variable speed governors, remote speed controls or with special governors to meet unusual requirements. Ask for Bulletin SR-114.



Terry Solid Wheel Turbine with Top of Casing Raised. Note the ruggedness and the ease with which the interior parts can be inspected — one of the country's leading oil companies employs 308 of these units for driving various types of refinery pumps. Full details are available in Bulletin S-116.



Axial Flow Impulse Terry Turbine — one of a complete line — built with either two or three rows of blading. These units, like all Terry turbines, are the result of over 45 years of successful experience in the manufacture of turbine drives exclusively. Completely described in Bulletin S-107.



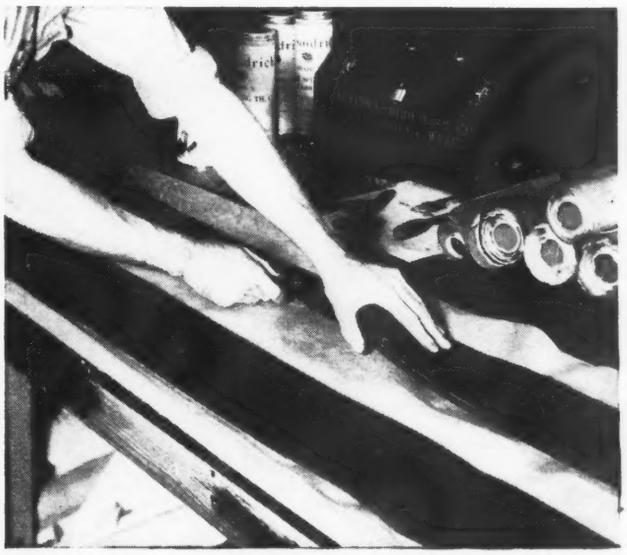
Twelve Terry Solid Wheel Turbines, similar to the above unit, drive auxiliaries in the power house of an east coast refiner. They operate with steam at 625 lbs. pressure — 700° Total Temperature. Eight of the machines exhaust against 125 lb. back pressure. The first of these units was purchased in 1931. It proved entirely satisfactory so that as the plant was enlarged, duplicate Terry's were added. Bulletin S-99.

THE TERRY STEAM TURBINE CO.

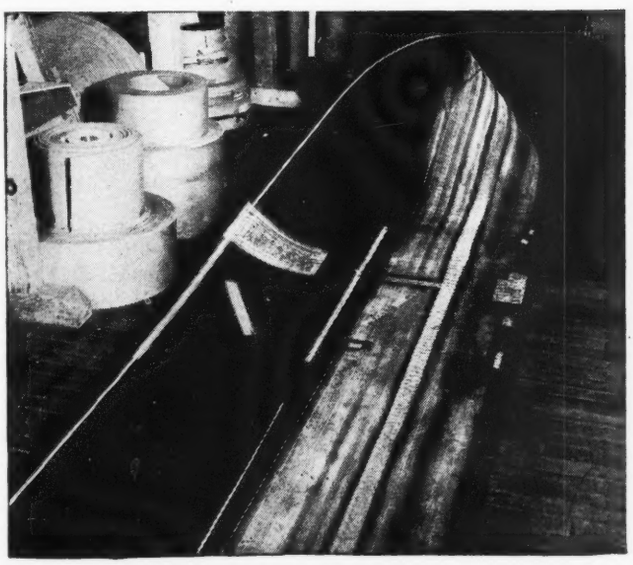
TERRY SQUARE HARTFORD, CONN.

Here's how others are conserving rubber

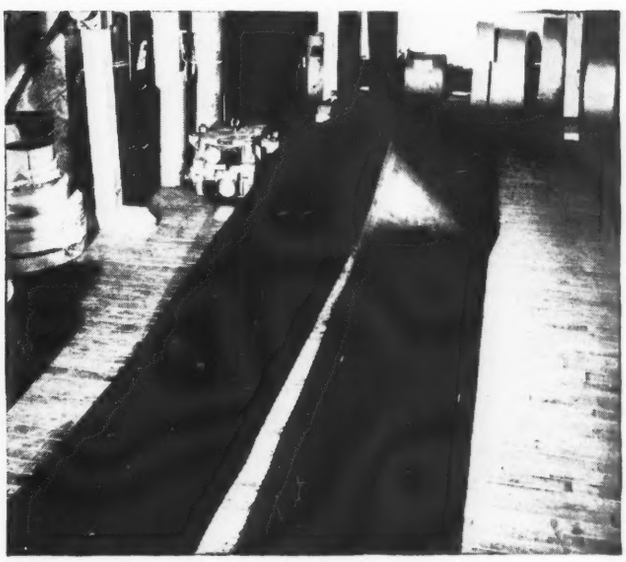
Trimming edges on a 6" feeder belt preparatory to putting on new rubber.



Same belt after it has been repaired. Good for many months additional service.



20" feeder belt with rubber removed from damaged places.



Same belt after it has been repaired. (To replace this belt with a new one would needlessly have consumed 200 pounds of rubber.)

Conveyor belts can have 9 lives

Another B. F. Goodrich suggestion to save rubber

LIKE the proverbial cat that has 9 lives, old, worn conveyor belts (and even belts that have been discarded) are proving they have additional lives —many are being revived for months of use that owners never expected.

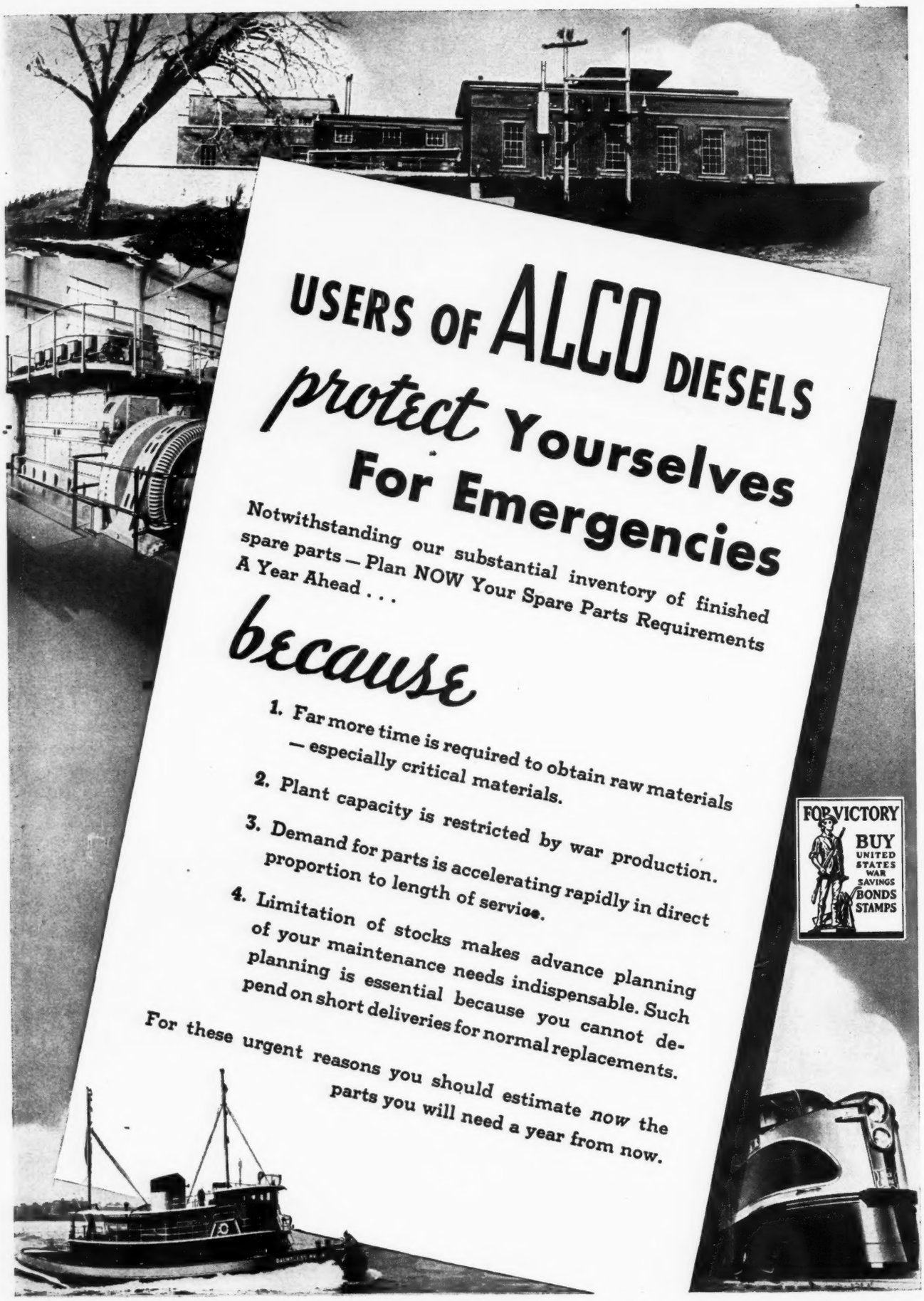
It's being done by the B. F. Goodrich repair method — worn parts are cut away, repair sections are fitted in and vulcanized in place by a portable vulcanizer. Cuts, gouges, tears, breaks and worn edges can be repaired in this way. Belts worn to the point of danger can be made safe, many belts already discarded can be put back into service, and tons of rubber can be conserved.

If you have any old conveyor belts that need repairs or that have been discarded, see your B. F. Goodrich distributor or write us for his address. Most distributors are trained and equipped to make belt repairs right in your plant. And they can show you how to save rubber in many ways, by proper care and maintenance of all your industrial rubber products. Write us, too, for a free set of folders on conservation of rubber products and, if you use conveyor belts, for the B. F. Goodrich Belt Conservation Manual. *The B. F. Goodrich Co., Industrial Products Division, Akron, O.*

ARMY-NAVY (E)

B.F. Goodrich

FIRST IN RUBBER



USERS OF ALCO DIESELS *protect* Yourselves For Emergencies

Notwithstanding our substantial inventory of finished spare parts — Plan NOW Your Spare Parts Requirements A Year Ahead . . .

because

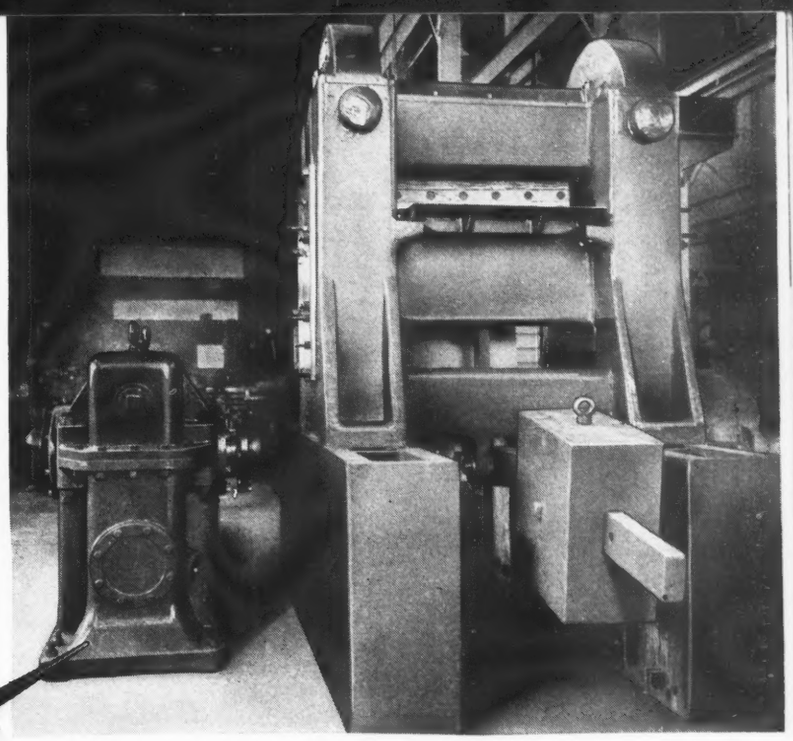
1. Far more time is required to obtain raw materials — especially critical materials.
2. Plant capacity is restricted by war production.
3. Demand for parts is accelerating rapidly in direct proportion to length of service.
4. Limitation of stocks makes advance planning of your maintenance needs indispensable. Such planning is essential because you cannot depend on short deliveries for normal replacements.

For these urgent reasons you should estimate *now* the parts you will need a year from now.

FOR VICTORY BUY UNITED STATES WAR SAVINGS BONDS STAMPS

DIESEL ENGINE DIVISION **AMERICAN LOCOMOTIVE COMPANY** AUBURN, NEW YORK

Philadelphia Worm Reducers have *what it takes* for tough jobs like this . . .



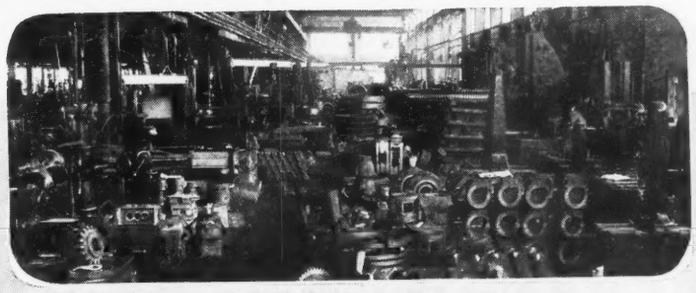
For hard service like driving the upset hot shear shown here at a metal plant Philadelphia Worm Gear Reducers prove the value of selecting a unit designed to include all efficiency features, with ample housing to assure adequate heat dispersal areas. These reducers are made for both horizontal and vertical drive conditions and in a wide range of horsepowers and ratios. Efficiencies of 85% to 95% are usual. Little, if any, maintenance is required except occasional lubrication.

Full details of construction and applications will be sent on request.

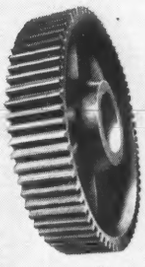
PHILADELPHIA GEAR WORKS

INDUSTRIAL GEARS AND SPEED REDUCERS
ITORQUE VALVE CONTROLS

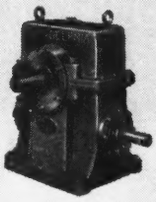
ERIE AVENUE & G STREET
PHILADELPHIA, PA.
New York, Pittsburgh, Chicago



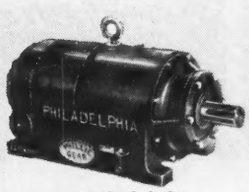
Philadelphia
LIMITORQUE CONTROL
operates all types of valves, etc., safely, economically, from convenient stations.



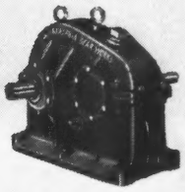
Philadelphia
GEARS
All types and sizes of industrial gears. Can be supplied in all materials.



Philadelphia
WORM GEAR SPEED REDUCER
right angle drives — vertical or horizontal. Wide range of ratios and horsepowers.

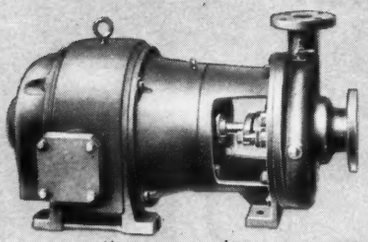


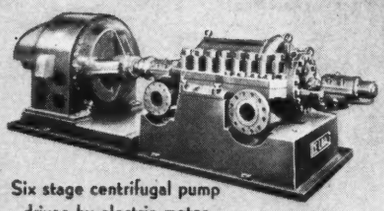
Philadelphia
MOTOREDUCER
The economical self-contained drive, Horizontal or Vertical types — various ratios and horsepowers.

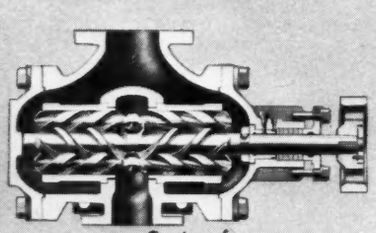


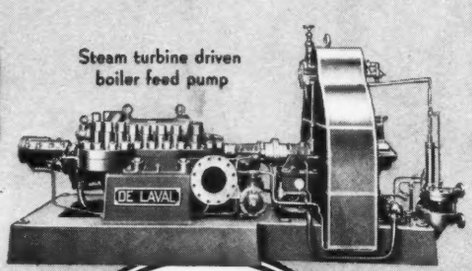
Philadelphia
HERRINGBONE SPEED REDUCER
for heavy loads at high speed. Single, Double, Triple Reductions, various ratios and horsepowers.

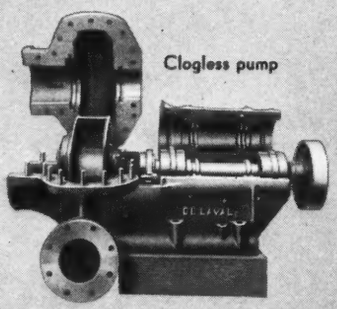
Single stage, double suction pump with motor drive


Motor - mounted pump

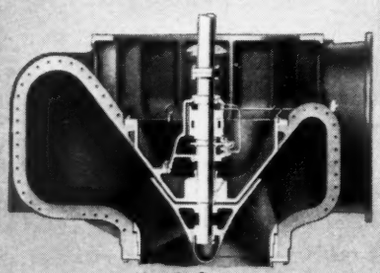

Six stage centrifugal pump driven by electric motor

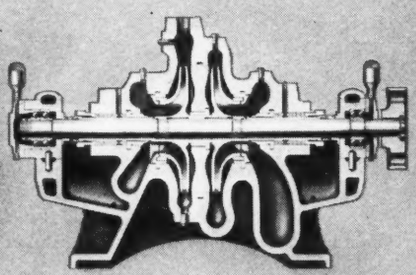

Section of De Laval - IMO oil pump

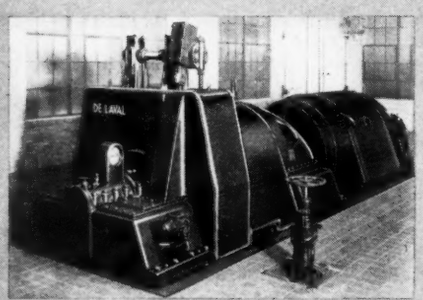

Steam turbine driven boiler feed pump

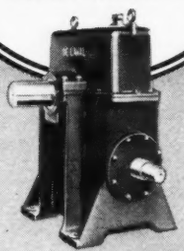

Clogless pump

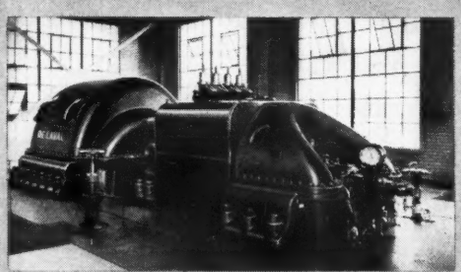
DE LAVAL Products

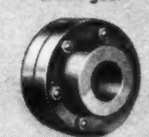

Mixed - flow pump

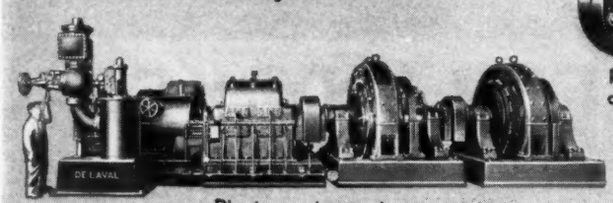

Opposed impeller pump

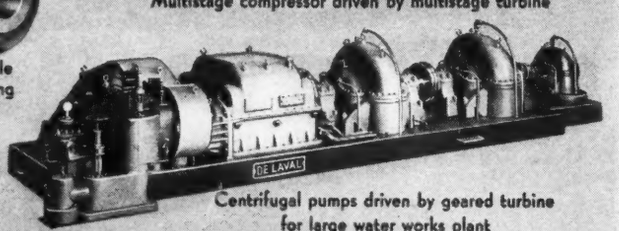

Steam turbine driving alternator


Worm gear


Multistage compressor driven by multistage turbine


Flexible coupling


Direct current generators driven by geared turbine


Centrifugal pumps driven by geared turbine for large water works plant

State requirements so that appropriate catalog may be sent.

3228

DE LAVAL *Steam Turbine Co.*
TRENTON, N. J.

MANUFACTURERS OF TURBINES . . . STEAM, HYDRAULIC; PUMPS . . . CENTRIFUGAL, CLOGLESS, ROTARY DISPLACEMENT, MOTOR-MOUNTED, MIXED-FLOW, PROPELLER, PRIMING SYSTEMS; CENTRIFUGAL BLOWERS and COMPRESSORS; GEARS . . . WORM, HELICAL; and FLEXIBLE COUPLINGS

POWER

MID-DECEMBER, 1942

Buyers' Guide Number

N O WYNKOOP
Publisher

PHILIP W SWAIN
Editor

F A ANNETT
S A TUCKER L N ROWLEY
Associate Editors

E W FELLER G A KEATES
Assistant Editors

PAUL WOOTON
Washington

G C TENNEY H S KNOWLTON
San Francisco *Boston*

E J TANGERMAN
Business Manager

Foreword—Looking Ahead in 1943 63

Annual Review—New Power and Mechanical Equipment 64

ASME Annual Meeting Report 99

Experience with Forced—Circulation Boiler 101

Recording Instruments Supervise Steam Turbines 102

Specific Speed Affects Centrifugal Pump Performance 103

Feedwater Heating Cycles—Boiler Scale Problems 104

Recent Developments in Diesel Ships 106

Supercharging Requires New Diesel Definitions 108

Continuous-Cleaning Grate Extends Spreader Applications 110

Review of Catalogs and Bulletins 120

Buyers' Guide—What and Where to Buy 201

COPYRIGHT, 1942, McGRAW-HILL PUBLISHING COMPANY, INC.
JAMES H. McGRAW, Founder and Honorary Chairman

JAMES H. McGRAW, JR
President

HOWARD EHRLICH
Executive Vice-President

MASON BRITTON
Vice-Chairman

B R PUTNAM
Treasurer

J A GERARDI
Secretary

J E BLACKBURN, JR
Director of Circulation

VOLUME 86

NUMBER 13

CHICAGO, 520 North Michigan Ave
SAN FRANCISCO, 68 Post St
WASHINGTON, National Press Bldg
PHILADELPHIA, 16 South Broad St
CLEVELAND, 1510 Hanna Bldg
DETROIT, 2-144 General Motors Bldg
ST. LOUIS, 1066 Paul Brown Bldg
BOSTON, 1427 Statler Bldg
ATLANTA, 1011 Rhodes Haverty Bldg
LOS ANGELES, 601 W 5th St
LONDON, Aldwych House, Aldwych,, London, W C 2

District Managers: S H Quarles New York; C R Long, Philadelphia
F B Godley, Cleveland; C Boughton, Chicago; C L Morton, Boston

Publication office: 99-129 North Broadway. Albany, N. Y. Editorial and executive offices: 330 West 42nd St, New York, N. Y. Member A B P. Member A B C. POWER articles are currently indexed in both the Industrial Arts and the Engineering Indexes, available at public libraries. Also every year POWER issues an annual index of its own. Cable address: "McGraw-Hill, N. Y."

YOU can get

Link-Grate EFFICIENCY for

Link-Grate stokers range from smallest industrial units to the country's largest

The Link-Grate is a *basic* design element in Westinghouse stokers. Its introduction brought to the industrial stoker field new standards of high efficiency, high availability, low operating and maintenance costs, quick and safe handling of fluctuating loads.

You can get Link-Grate advantages for your steam plant—regardless of available fuel supply, regardless of capacity. Link-Grate stokers, single or multiple retort, rear or side ash discharge, burn any grade of bituminous coal at top efficiency.

SINGLE RETORT—The Link-Grate single retort stoker is a side ash discharge unit which requires no special tile or arch work, no difficult furnace changes, no deep excavation. Main elements of the stoker mechanism are shipped assembled and are easy to install. Yet it gives you *all* the advantages of Link-Grate operation.

MULTIPLE RETORT—These larger Link-Grate units are rear ash discharge stokers. Unit retorts are shipped assembled for easy installation. Frames cover a wide range of sizes to fit capacity requirements up to the largest.

J-50421

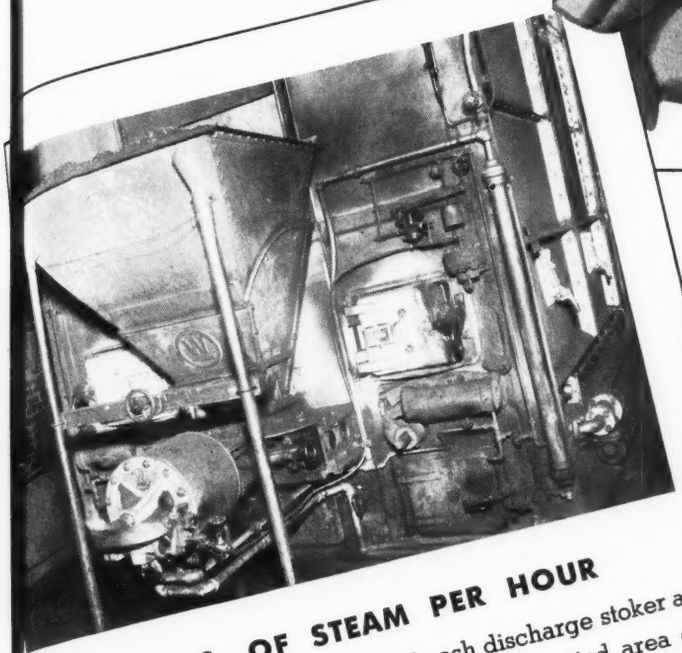
two books

cover the facts

These two Link-Grate fact-books cover the full range of industrial stokers. They present the facts you want to know about a stoker for your plant. Send for Bulletin 3039 (multiple retort), 2196-A (single retort) for complete information on Link-Grate stokers. Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., Dept. 7-N.

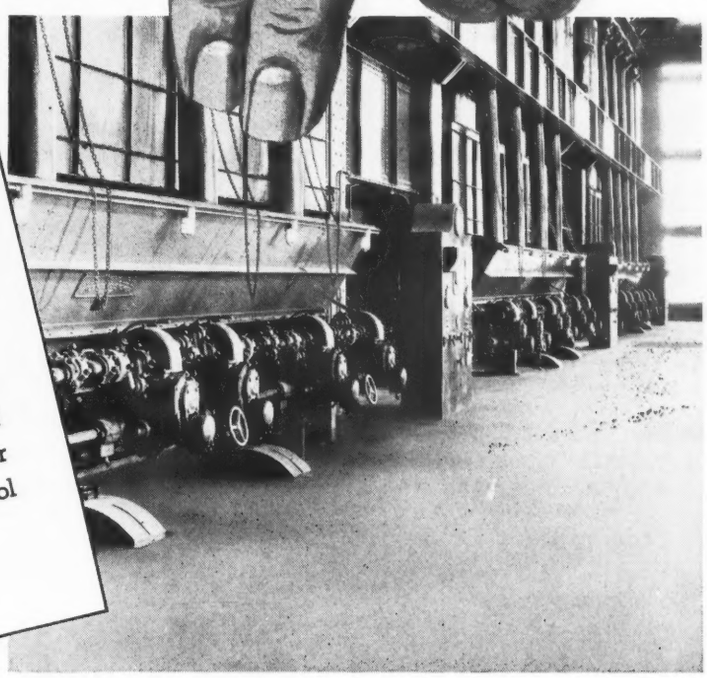
Westinghouse

or your plant



20,000 LBS. OF STEAM PER HOUR

This Link-Grate single retort side ash discharge stoker at Ryegate Paper Co., Ryegate, Vt., has a projected area of 63 sq. ft. This company reports that fuel savings over previous firing methods will pay for boiler, stoker, control equipment, engineering and installation in 28 months.

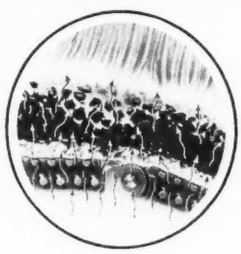


350,000 LBS. OF STEAM PER HOUR

Six of these 18 retort Link-Grate rear ash discharge stokers are installed in the main power station of a large eastern utility. They are the country's largest single-end stokers, each having a projected area of 730 sq. ft. and a furnace volume of 15,000 cu. ft.

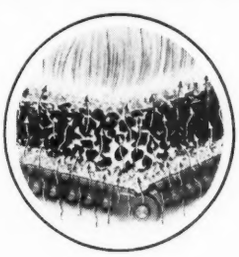
Link-Grate motion is the same for large or small stokers

HERE'S HOW IT WORKS



GRATES UP

Fuel bed opened, permeated with low pressure air. Fused ash oxidized, clinkers broken into small, friable pieces.



GRATES DOWN

Fuel bed cracked, crumbled and made porous for uniform flow of gases throughout the entire fuel burning area.

BYERS WROUGHT IRON

Reducing Maintenance isn't one job—

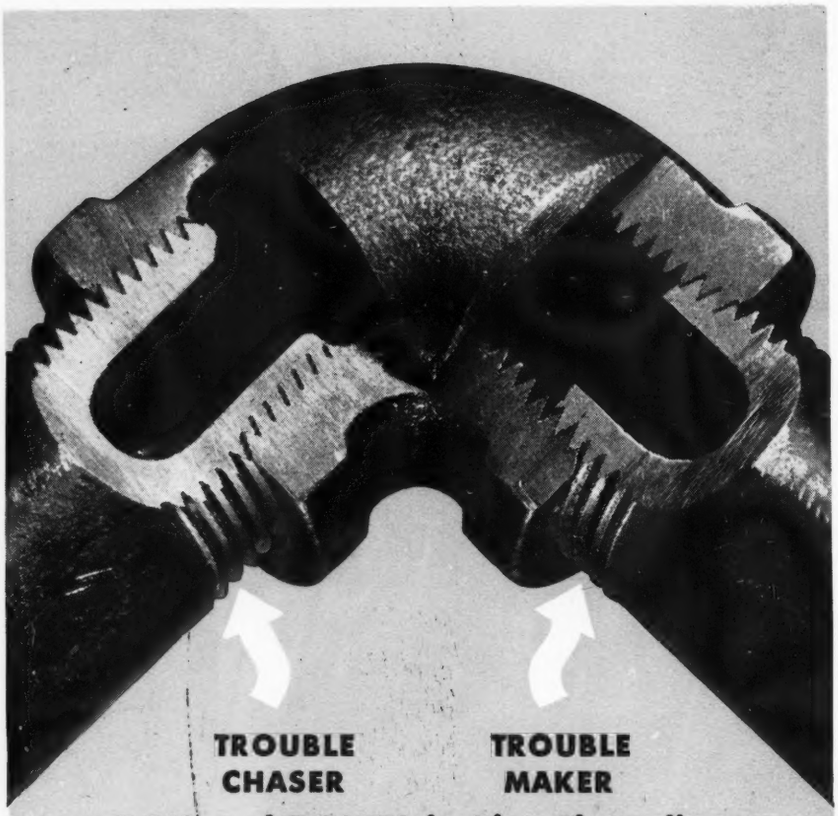
IT'S 2

- Proper Material Selection
- Proper Installation Methods

Maintenance of piping systems is one of the primary responsibilities of most plant engineers. The job is complicated today by three-shift operations, lack of "stand-by" equipment, and material shortages.

In eliminating premature failures, there is no substitute for picking the right material for the job . . . but improper installation practice can offset all the good accomplished by proper selection.

Pipe has been one of the main Byers products for over 75 years. During this time the company has, through individual contacts with plant engineers, learned a considerable amount about piping problems. Much of this information has been transferred to paper in the form of technical bulletins and "ready-reference" charts (listed below) and confidential studies and reports carried by Byers technical service representatives.



DO'S and DONT'S in Pipe Threading

Don't try to work with dull tools.

Don't put new or sharpened chasers in a worn stock, and don't try to use a set of chasers after long use or abuse has impaired its precision.

Don't skimp on oil—either in quantity or quality.

Accurately center the die and tighten the thumb screws WITH A WRENCH in hand threading. Line up the pipe properly in the grips in machine threading.

Clear slots of all dirt, gummy oil, chips, etc., when you change chasers.

Have chasers reground *by someone who knows how,* or who will accurately follow directions.

Cut off pipe ends square and true, so die can start straight.

When trouble occurs, *check up on your equipment first.* The trouble may be something a little adjustment will fix.

And finally, cut the thread long enough to engage fully the threads in the fitting, as shown above at left. A thread like the one illustrated above at right is too short to resist mechanical forces caused by expansion, contraction and vibration.

Current conditions make this information of even greater value than normally. Please feel free to ask for any of the publications, to supplement your file of engineering data, to pass on to subordinates who are now handling new and more responsible jobs, or to use in the training of new employees.

A. M. Byers Company. Established 1864. Offices in Pittsburgh, Boston, New York, Philadelphia, Washington, Chicago, St. Louis, Houston, Seattle, San Francisco.

Here:
SOME HELPS IN SOLVING MAINTENANCE PROBLEMS

General Catalog
Concise and detailed information on all products.

Piping Bulletin
Discusses pipe corrosion and its control.

Tank Bulletin
Illustrates many trouble-resisting installations.

Smoke Stack Bulletin
Helpful data on this subject.

Radiant Heating Bulletin
How to design, figure and install.

Welding, Bending, and Threading Wall Charts
Tips for shop men on proper threading, welding and bending practice. Bulletins on each subject also available on request.

Corrosion costs you more than Wrought Iron

BYERS GENUINE WROUGHT IRON
TUBULAR AND HOT ROLLED PRODUCTS
STEEL TUBULAR PRODUCTS

POWER

Established 1882 • PHILIP W SWAIN, Editor

All Set for 1943

Nineteen hundred and forty-two is finished, and America at war looks to the new year with a firm resolve to win ultimate victory, no matter what the cost.

Throughout the year, power men have been keenly aware of their responsibility to their country and its war effort: to keep boilers steaming and generators turning, regardless of priorities, shortages, lack of manpower and other obstacles to normal operation. They have, with all the inherent skill of the power engineer, improvised equipment to replace that unavailable or diverted to the armed services, guarded machinery against failures that would interrupt war production and trained new men to take the place of those lost.

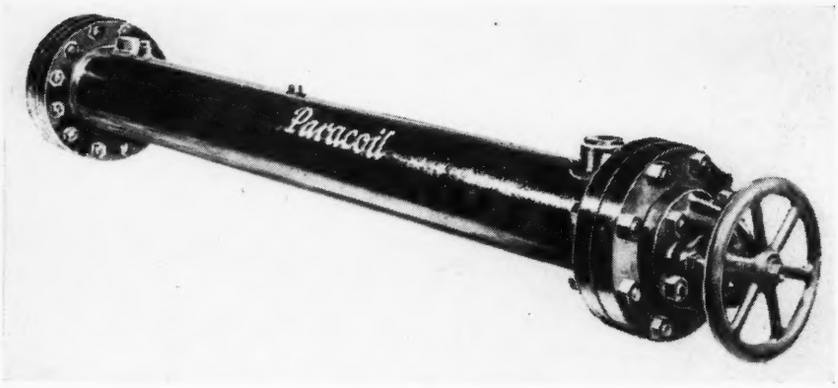
The coming year will see plants strained to the utmost to produce more and more power, to keep the planes, tanks and guns rolling off the assembly lines in an ever-growing stream. To assist them POWER here presents, in addition to the technical information published during the year, a practical, useful guide for 1943. This includes (1) descriptions of more than 300 pieces of new and improved equipment placed on the market this year, page 64; (2) digests and discussions of important power papers presented at the annual meeting of the American Society of Mechanical Engineers, page 99; (3) reviews of over 350 catalogs, bulletins and booklets issued during 1942, page 120; (4) picture highlights of the Power Show, page 95; and (5) an enlarged Buyers' Guide to power equipment and manufacturers, page 201.

This down-to-earth issue will help with the 1943 job by enabling the power man to catch up with the year's developments in equipment, by providing a means for him to augment his technical library with manufacturer's literature, and by listing in one place manufacturers of power equipment with whom he can place his priority-backed orders for essential new supplies.

Review of Power and Mechanical Equipment

Boilers, Stokers, Turbines and Accessories 64
Compressors . . . 67
Diesels, Gas Engines and Accessories . . 67
Heating, Ventilating Refrigerating and Air Conditioning . . 67
Hose, Packing and Paints 70
Lubricating 70
Mechanical Transmission and Materials Handling 72
Meters and Instruments 75
Miscellaneous . . . 79
Motors, Switches and Other Electrical Equipment 83
Piping, Fittings and Valves 90
Pumps . . . . : : 92
Welding Equipment . 94
Wrenches and Other Tools 114

In the pages that follow, POWER presents its fifteenth annual review of new and improved equipment. The descriptions presented here are summaries of those which have appeared in POWER since January 1, 1942, plus additional items received in the past month



1

BOILERS, STOKERS, TURBINES AND ACCESSORIES

1 HEAT EXCHANGER — Paracoil self-cleaning heat exchanger eliminates necessity of manually or chemically cleaning apparatus. A few turns of the handwheel, shown in illustration, while the heat exchanger is in operation, restores surface in contact with medium being heated or cooled to its original clean condition. No internal mechanism to get out of order or require replacement because of normal wear. *Davis Engineering Corp, 1064 East Grand St, Elizabeth, N. J.*

2 FIRE EFFICIENCY FINDER—Fire Efficiency Finder was developed for use with Bacharach Fyrite CO_2 Orsat Analyzer. Consists of calculator that converts CO_2 and stack-temperature readings instantly into heat loss and heating efficiency percentages. Fire Efficiency Finder together with Orsat supplies engineers with simplified, quick way to determine furnace performance, as a complete CO_2 test can be made in 40 seconds with the Orsat. The calculator then converts the readings instantly into terms of degree of furnace efficiency, completing the test. *Industrial Instruments Co, 7000 Bennett St, Pittsburgh, Pa.*

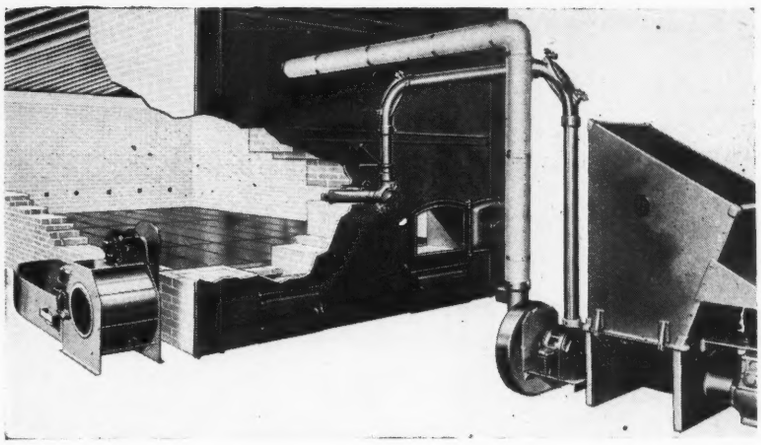
3 SMOKE ALARM—Photoswitch smoke alarm said to increase combustion efficiency by indicating the degree of smoke density passing through the stack, and signaling conditions of efficient combustion and excess smoke on green and red signal lights. Equipment includes photoelectric control, light source and indicator. Design of lens-system mounting said to minimize possibilities of soot and dust gathering on the lens. *Photoswitch Inc, 21 Chestnut St, Cambridge, Mass.*

4 SPREADER STOKER — Pneumatic spreader stoker with separate undergrate fan unit said to be able to burn efficiently lower-grade bituminous, sub-bituminous and lignite coals. Coal conveyed and distributed on a stream of air and hot gases; fines burn in suspension, utilizing conveying air for combustion. Larger pieces form a shallow fuel bed on grate. Stoker can be located anywhere within a reasonable distance of boiler front, and coal is fed automatically either from a large-capacity hopper or directly from the bunker. Capacities range from 30 to 1000 bhp. *Iron Fireman Mfg Co, Portland, Ore.*

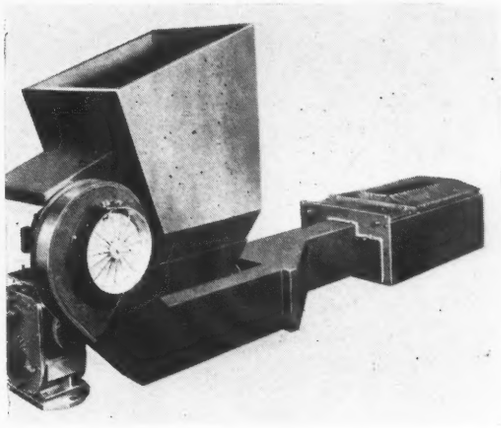
5 UNDERFEED STOKER — Redesigned line of company stokers includes hopper and bin-feed models with clinker-type

2

3



4



5

burners (illustrated), or with side dumping grates. Units equipped with 3-speed heavy-duty automotive transmissions, oversized motors and fans. Totally enclosed windboxes and stoker fronts provided to assure airtight chambers and to eliminate much installation expense. *Frederick Iron & Steel Co, Frederick, Md.*

6 CONDENSATE-RETURN SYSTEM—Eductor principle of operation in return system insures thorough condensate and air removal from process apparatus. Then after expulsion of air from closed circuit, condensate is returned to the boiler at a temperature near that of process without flash loss and with fuel saving. Specially designed centrifugal pumps draw water from thermo-fin priming loop and discharge it as a high-velocity jet through jet-pump nozzle. This jet, striking returned hot condensate, induces condensate flow through mixing tube into thermo-fin priming loop. Additional volume of returned condensate introduced into constantly filled loop results in discharge of equal volume through air separator to the boiler. *Cochrane Corp, 17th & Allegheny Ave, Philadephia, Pa.*

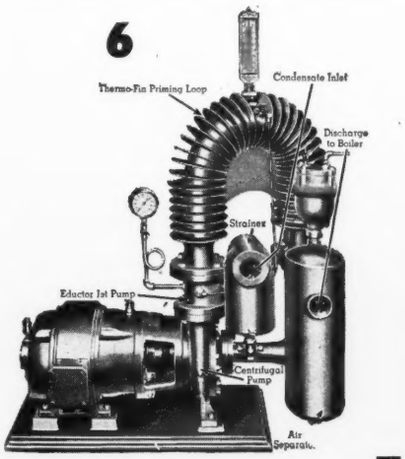
7 FURNACE DOOR—Of high-quality cast iron, door is balanced and swings open and closed on heavy hinges. Locktight handle closes door tightly, eliminating all infiltration of excess air around the door. Door lined at factory with Plicast L-W-1 light-weight insulating refractory material. This lining said to reduce weight of door, protect metal from heat and decrease radiation of heat to boiler room. Cast-iron door available in right-hand opening only, as shown. *Plibrico Jointless Fire-Brick Co, Trenton, N. J.*

8 AUTOMATIC DAMPER REGULATOR—American damper regulator adapted to Fyr-Feeder installations operated by on-and-off control method. Regulator mounted on standard Fyr-Feeder control panel as shown in the photo. Consists of a powerful gearmotor which moves damper control arm up and down. Limit switches stop motor at proper points at top and bottom of the stroke. In operation, when pressure switch on control panel closes, because of a drop in steam pressure below the predetermined point, damper-regulator motor starts, opening stack damper. Ten seconds later, after damper is fully opened, switches on control panel start coal feed, coal blower and forced-draft-fan motors. When steam pressure reaches desired point, pressure switch opens, stopping coal feed, coal blower and forced-draft-fan motors, and starting damper-regulator motor. This runs for ten seconds, closing stack damper and conserving full furnace heat cycle repeats each time pressure drops. *American Coal Burner Co, Chicago, Ill.*

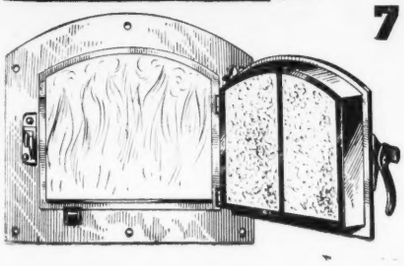
HAND - OPERATED STOKERS—Company announces complete line of "self-cleaning" hand-operated stokers for changing over boiler installations formerly dependent on other fuels threatened with scarity at this time. In American "self-cleaning" stoker, the coal is placed on the front of the stoker, and distributed mechanically. One lever does it, advancing the fuel toward the dump plate where the ashes can be dumped as they accumulate. Stokers designed for operation with natural draft and require no steam or electric power Sizes: 100 to 4000 lb of coal per hr. *American Coal Burner Co, Chicago, Ill.*

WATER CONDITIONING SYSTEM—Technical water-conditioning system combines advantages of complete supervision and analytical servicing of boiler, feed line, condensers, etc, plus a simplified natural water correction. Utilizes individualized Baerite Organic Formulas developed from analysis of water samples and boiler system conditions. These formulas are individual variations of standard formulas previously marketed by the company. Formula variations are assigned special identification, similar to prescriptions, and are supplied to original user only, except in possible cases of duplicating water conditions. Regular boiler inspections and recommendations by company experts are important part of service. *Water Treatment*

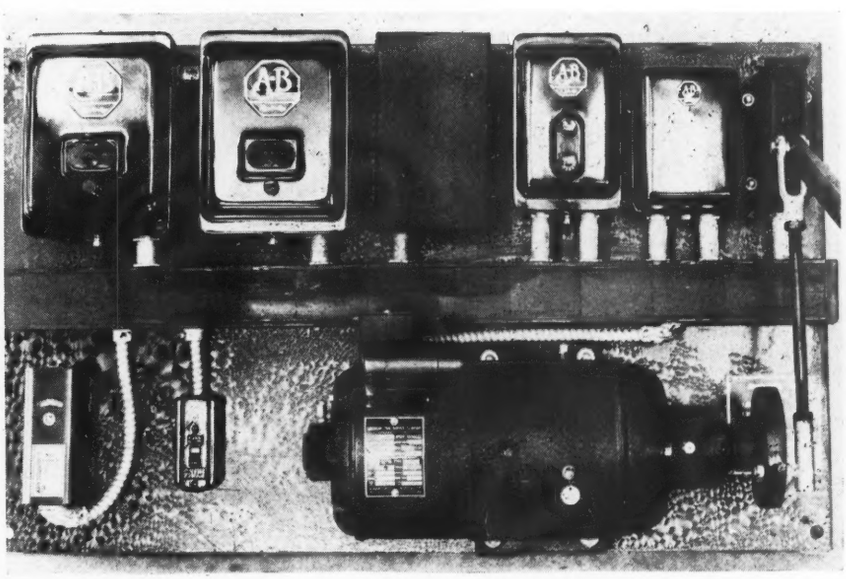
6



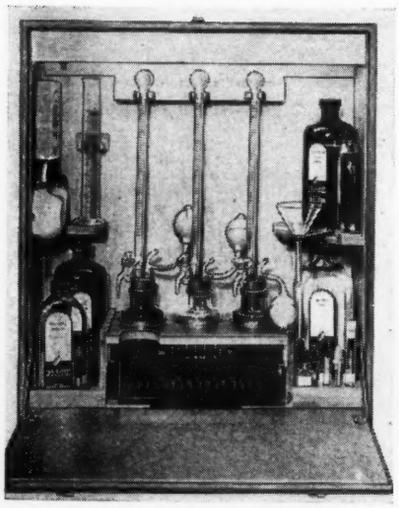
7



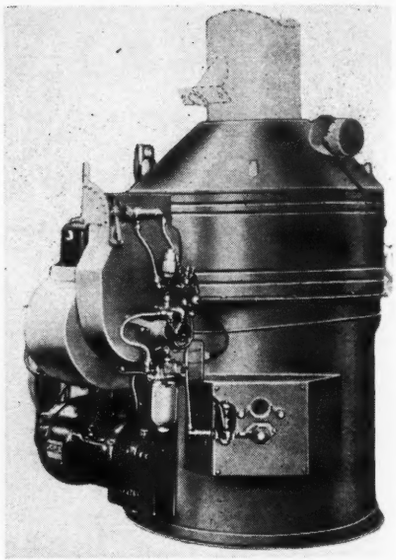
8



1



2



3

Company of America, Pittsburgh, Pa.

DUST COLLECTOR—"Dustkop" unit-type dust collector has 600 cfm rating and is equipped with ¼-hp 3450-rpm 110-volt ac continuous-duty single-phase motor. Removal of collected dust and dirt accomplished by lifting louvered cover, taking out filter assembly and lifting out pan into which dust has fallen after being stopped by filter. *Aget-Detroit Mfg Co, Book Bldg, Detroit, Mich.*

WATER TREATMENT—Tanalginate is the result of combining both protective and reactive colloidal materials, having as its base both tannin and alginate. Tanalginate is used in conjunction with inorganic chemicals such as phosphates or alkalies. It is not in itself a complete treatment for conditioning water. When used under competent supervision and control, the results obtained by such dual treatment are claimed to be far beyond the limitations of inorganic chemicals alone. Characteristics of the sludge said to be vastly changed and the sludge becomes highly liquid and not subject to dehydration under intense temperatures encountered in high-pressure boiler operation. Tanalginate can be safely fed through feed lines, as it exhibits a positive inhibiting action on feed-line deposits. Supplied in several different formulations and pH values, depending entirely upon the nature of the water to be treated. *Bird-Archer Co, 400 Madison Ave, New York, N. Y.*

COATING—Carbozite high-temperature-resistant coating is new specialized coating developed for resisting deleterious effects of temperature up to 2000 F. Approximately 150 sq ft per gal can be covered on first coating, while second coat will give 200 sq ft per gal. *Carbozite Corp, First National Bank Bldg, Pittsburgh, Pa.*

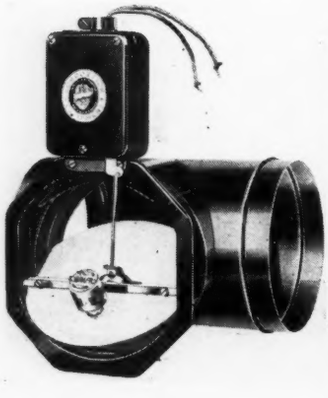
1 STOKER TIMER—Synchronous stoker timer has removable timing mechanism and employs self-starting line-voltage synchronous motor. Standard models operate at 30- or 60-min intervals, with "hold-fire" period adjustable from one to eleven minutes. To test fire, an external knob is turned until stoker starts. *Perfex Corp, 500 W Oklahoma, Milwaukee, Wis.*

2 TESTING EQUIPMENT — Series "A" test sets include necessary chemicals and apparatus for determining hardness, alkalinities, chlorides, phosphates, and sulphites in water, when any two, three or four of these tests are required. A portion of open cabinet door forms convenient acid-resistant laboratory work table, and fluorescent lamp provides correct illumination when making test. *W H & L D Betz, Gillingham & Worth Sts, Frankford, Philadelphia, Pa.*

3 STEAM GENERATOR — Recirculated steam-generating unit said to be capable of producing steam from a cold start to pressures up to 300 psi in less than two minutes. Available in standard "packages" of 500, 1000, 1500, 2000, and 3000 lb evaporation per hr. Unit requires no boiler room and is completely automatic or semi-automatic according to requirements. Single motor drives all accessory units, with water pump and fuel feed controlled by steam demand. *Vapor Car Heating Co, Inc, 80 E Jackson Blvd, Chicago, Ill.*

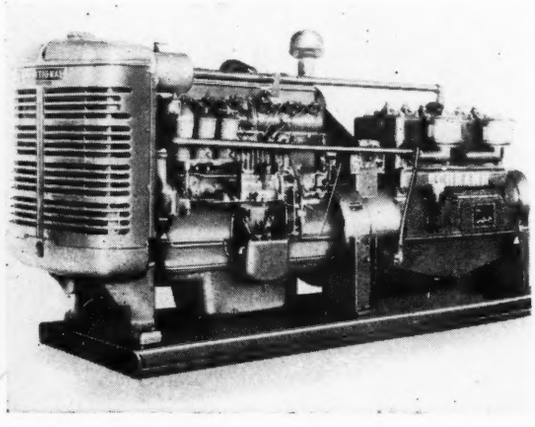
4 DRAFT CONTROL — Model BM motorized Draft-O-Stat is standard Model B with addition of electric controlling motor. Barometric draft controls are balanced, counterweighted metal air valves, usually mounted on flue pipe chimney furnishing constantly fluctuating draft or vacuum. Unit is welded-steel construction, with polished fittings and adjustable mechanism. *Combustion Equipment Div, Hotstream Heater Co, Cleveland, Ohio.*

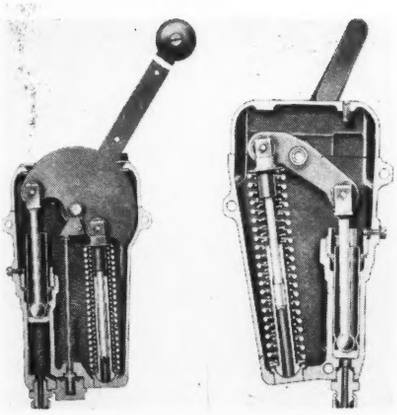
4



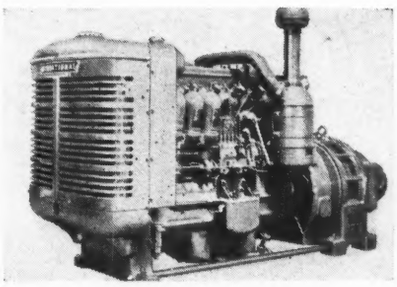
5

6

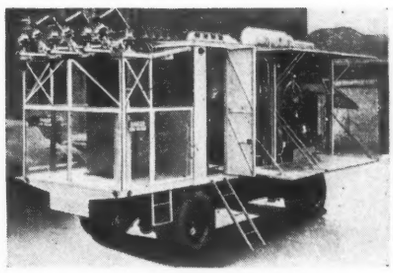




7



8



9

COMPRESSORS

5 COMPRESSOR — Model 50 compressor, small compact unit, has wide applications in manufacturing plants, foundries, and for emergency and standby service. No foundations required for this unit. Special attention has been given to accessibility of various working parts. *Schramm, Inc, West Chester, Pa.*

6 COMPRESSOR—"Engine drive-in-line" compressor built in sizes from 120 to 600 cu ft displacement, designed for applications not reached by electric power service, or where gasoline, oil, diesel, etc., power units are preferred as driving mediums. *Schramm, Inc, West Chester, Pa.*

DIESELS, GAS ENGINES AND ACCESSORIES

7 ENGINE CONTROL—Exactor provides positive-action control of diesel engines, through throttle such as on ships, etc, from central point. Consists of transmitter and receiver, conected by single tube filled with low-freezing-point liquid. Equal and constant forces eliminate lost motion and backlash. *Sperry Products, Inc, Hoboken, N. J.*

8 POWER PLANT—Ready-power diesel-electric plants powered by International Harvester diesels. Eight plant models available which cover range between 12½ and 50 kw Company generators capable of producing all electrical power engine can develop. *Ready-Power Co, Detroit, Mich.*

9 MOBILE PLANTS—Each mobile unit carries two 50-kw Ready-Power diesel electric plants, switchboard, fuel oil storage tank, electric fuel-transfer pump, lubricating-oil rectifier, starting batteries, station transformer, both ac and dc lighting system, and a substation with transformer, lightning arrestors and air-break switches. *Ready-Power Co, Detroit, Mich.*

ENGINE-ROOM GRATING — Light-weight self-supporting panels are of perforated metal to take 24- or 30-in. spans and to lay 12- or 24-in. centers. Said not to set up a drumming noise when installed near diesel engines. *A B Tappen, 71 Nassau St, New York.*

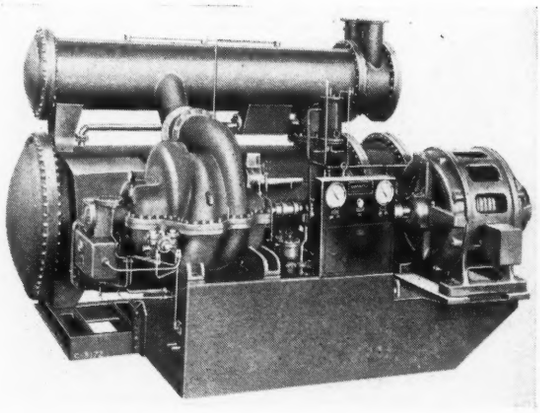
HEATING, VENTILATING, REFRIGERATING, AIR CONDITIONING

10 LIQUID COOLING SYSTEMS—New line of systems designed for air conditioning and industrial process requirements. Centrifugal compressor is of volute design. Systems available in sizes covering range from 150 to 1200 tons. *Worthington Pump & Machinery Corp, Harrison, N. J.*

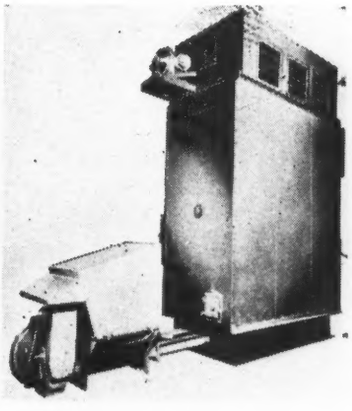
11 UNIT HEATER—Direct-fired coal-burning unit heater equipped with underfeed stoker and either hopper or bin feed. Also available for hand firing with undergrate fan. Tightly welded combustion chamber prevents infiltration of excess air. *Dravo Corp, Pittsburgh, Pa.*

12 CABINET CONVECTOR—Non-metallic cabinet convector replaces all-metal convectors and radiators. Except for screws, cabinets are constructed entirely of non-metallic materials. Two cabinet types available; one a wall suspension and the other a free-standing floor unit. *Trane Co, La Crosse, Wis.*

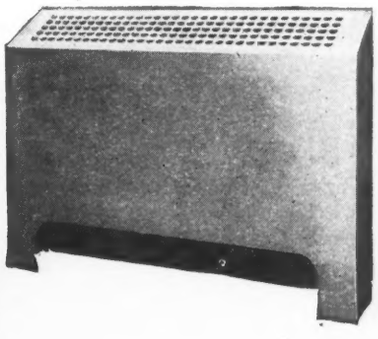
10

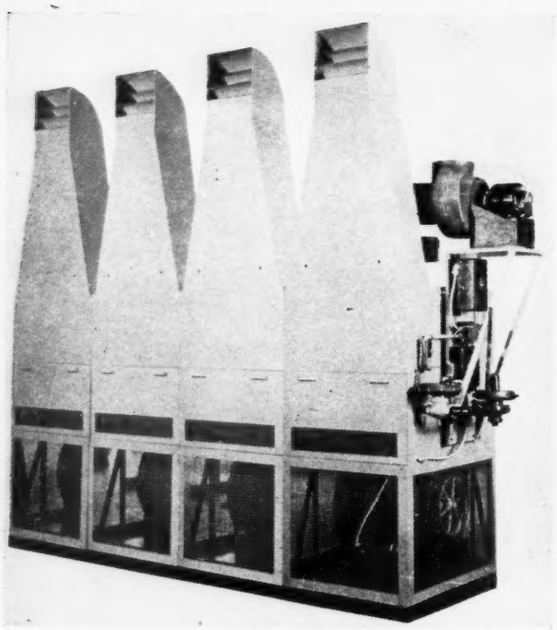


11

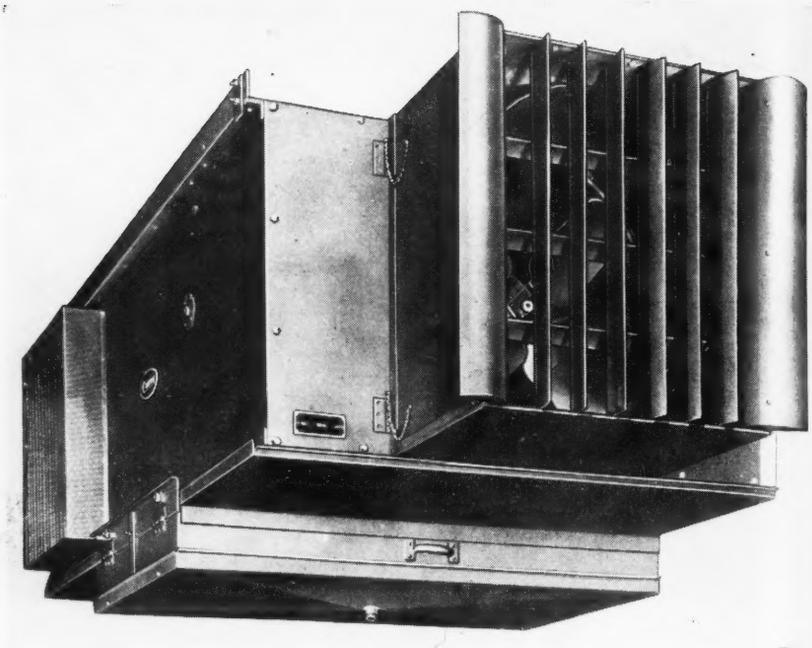


12





1



2

COOLING UNIT—Young QUAD atmospheric cooling unit resembles 14-foot tower with base about 12 ft square. Unit's sides are heat-transfer surfaces for water, oil or gas cooling, and for steam or vapor condensing, as required. It is possible with this unit to cool a diesel engine of approximately 2000 hp capacity, handling both the engine-jacket water and lubricating-oil cooling load at a horsepower expenditure under 25 hp. *Young Radiator Co, Racine, Wis.*

ELECTRIC UNIT HEATER — Electric unit heaters available in 5 and 7½-kw sizes, 230 volts, 50 and 60 cycles, with an output of 17,060 and 25,590 Btu, respectively. Unit is powered by ⅛-hp motor with resilient mounting, 4-blade fan operating at 1725 rpm to produce 615 cfm at a velocity of 785 fpm. *Westinghouse Electric & Mfg Co, East Pittsburgh, Pa.*

EXHAUSTER, VENTILATOR—Octopus exhauster and ventilator specifically designed for use in welding departments, ship, holds, etc. Exhauster can be converted into fresh-air ventilator by simply changing position of tube adapter which is part of the equipment. *Chelsea Fan & Blower Co, 1206 Grove St, Irvington, N. J.*

THERMOSTATS—Actually two thermostats in one, DSK series thermostat has been added to extensive line of SK series units. Temperature ranges are 300, 450 and 700 F. Can be connected as two single-pole single-throw switches or as one single-pole double-throw switch. *George Ulanet Co, E Kinney St, Newark, N. J.*

UNIT HEATER—Modine steel condenser unit heater has been designed to conserve critical copper and copper alloy. Style S/S includes both horizontal- and vertical-delivery heaters. *Modine Mfg Co, Racine, Wis.*

1 UNIT HEATER — Heavy-duty unit heater added to company line of Janitrol gas-fired space-heating equipment. Unit is built up as series of sections, each having input rating of 250,000 Btu per hr. Each section has its own individual heat-exchanger assembly, pilot, limit control *Surface Combustion Corp, Toledo, Ohio.*

2 HUMIDIFIER — Carrier unit provides humidified air, automatically controlled; cooling by evaporation; tempering, cleaning and uniform circulation of air. Features of new unit include the suitability to any size plant, requires no floor space, and uses no distributing ducts. *Carrier Corp, Syracuse, N. Y.*

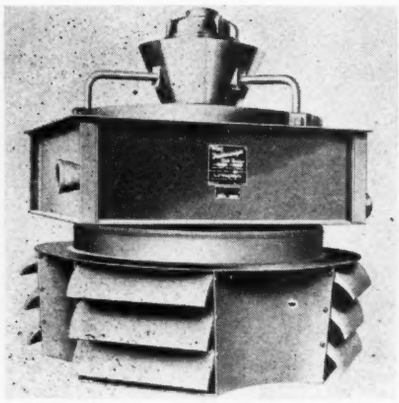
3 FAN—Victory Axiflo fan is at present restricted to Navy work, but will be available to general industry after the war. Consists of a multi-blade wheel direct-connected to an enclosed motor mounted in a spoke assembly in the housing, spokes serving as air-flow straighteners for the unit. *B F Sturtevant Co, Hyde Park, Boston, Mass.*

4 REVOLVING UNIT HEATERS—Addition to line of revolving unit heaters is this variable-discharge heater. Provision for adjusting amount of heated air discharged from any side of the heater is incorporated in discharge outlet, making it possbile to heat a long narrow building with one heater. *L J Wing Mfg Co, 160 W 14th St, New York, N. Y.*

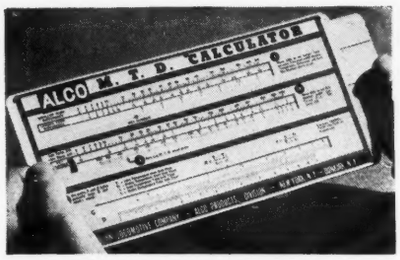
5 EVAPORATIVE CONDENSER — EVS Aquamisers made in complete range of sizes from 5 to 100 tons normal refrigeration capacity. Consists of three major

3

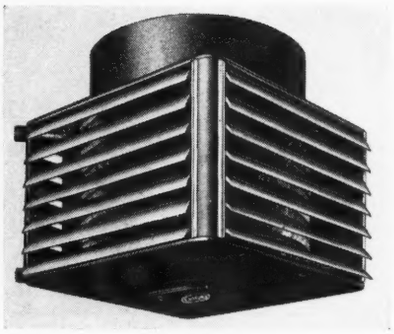
4



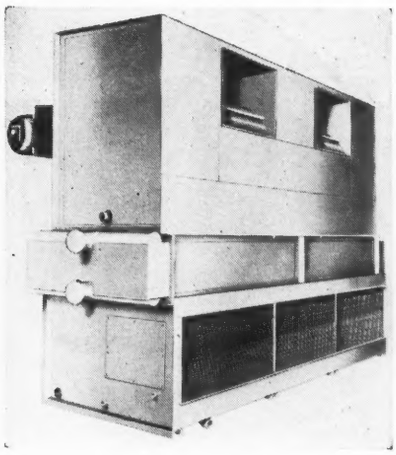
5



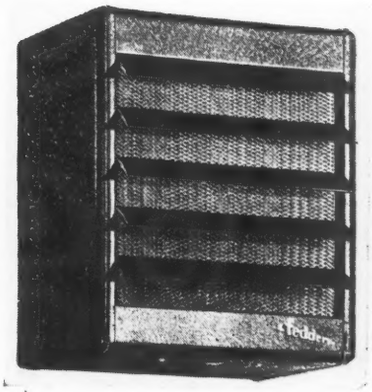
6



7



8



9

sections: fan, condenser and sump. Typical applications include jacket-water cooling for diesel engines and air compressors, quenching-oil cooling and other evaporative uses. *Westinghouse Electric & Mfg Co, East Pittsburgh, Pa.*

6 MTD CALCULATOR—Alco calculator has been devised to help in the approximation of heat-transfer surfaces when preparing estimates or specifications for heat-exchanger equipment. Calculator includes scales for calculation of the logarithmic MTD, as well as the correction factors for 1, 2, 3, 4, and 6 shell passes. *American Locomotive Co, Alco Products Div, 30 Church St, New York, N. Y.*

7 UNIT HEATERS—Carrier type 46S 5-way unit heaters are vertical-suspended, propeller type units. Supply maximum air quantity at low final temperature. Discharge air louvers permit control of air discharge angle and velocity, allowing use of one large unit in place of several small ones. Louvers are independently adjustable, permitting directing air streams in several different directions at the same time to reach various places. *Carrier Corp, Syracuse, N. Y.*

8 QUENCHING-OIL COOLER — Trane unit recommended for industrial applications calling for the quenching process of hardening steel. Unit utilizes atmospheric evaporative principle. Water consumption is negligible, and temperature of local water supply is of no importance. Any desired temperature not lower than 100 F can be maintained automatically. *Trane Co, La Crosse, Wis.*

9 UNIT HEATERS—Series 4 low-temp unit heaters announced. Performance characteristics include ideal conditions of low final temperature, combined with large cfm and long-range heat distribution. *Fedders Mfg Co, Buffalo, N. Y.*

10 UNIT HEATERS—"Grid" fins or sections of this heater are now of cast iron instead of aluminum, to conserve critical materials. C I series are designed and tested to operate with either steam or hot-water systems, for steam pressures from two to 250 lb. *D J Murray Mfg Co, Wausau, Wis.*

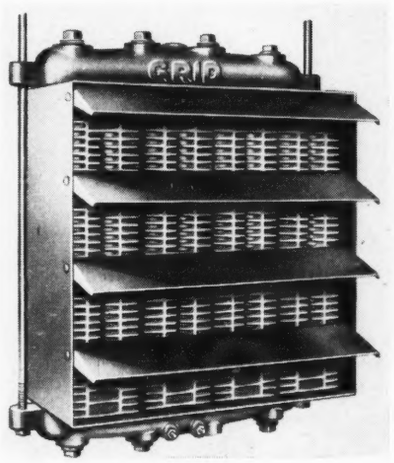
11 HEATERS—Glasohm low-power flexible heating element is used on water-immersion applications, heating marine instruments, and to provide localized heat for chemical and laboratory apparatus. Can be obtained from a few inches to several feet in length. *Clarostat Mfg Co, 285 N 6th St, Brooklyn, N. Y.*

12 GRILLES — Sight-tight ventilating grilles meet demand for ventilation unit which cannot be seen through from any angle. Fins are of an inverted V shape and overlap. Can be used for exterior fresh air intake openings. *Barber-Colman Co, Rockford, Ill.*

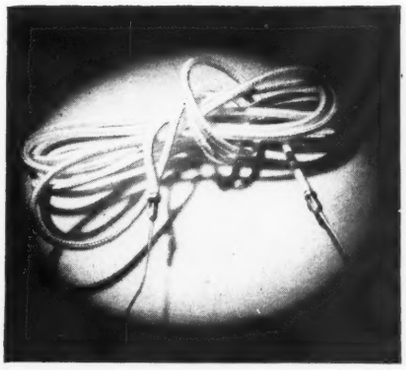
VENTILATORS—designed to prevent transmission and reflection of illumination from building interior, or reflection of light from night sky, war plant ventilators available as exhaust units, supply ventilators, and tempering units. Each-type mentioned comes in three standard capacities—10, 000, 15,000 and 20,000 cfm. *Carrier Corp, Syracuse, N. Y.*

THERMOSTAT—Type ASK-BB thermostat has silver contacts and comprises a ½-in. bimetal element mica-insulated from a ½-in spring. Can be supplied either normally open or normally closed. *George Ulanet Co, E Kinney St, Newark, N. J*

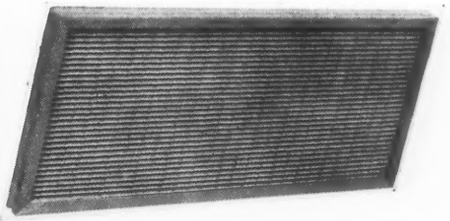
10

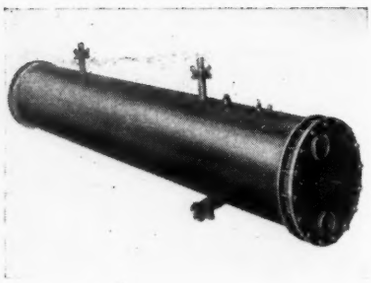


11

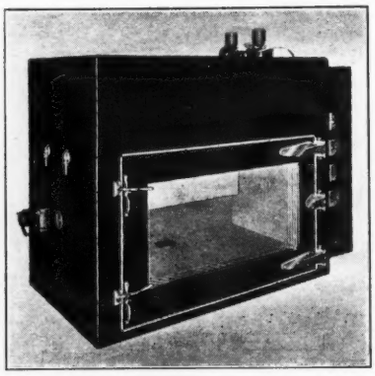


12

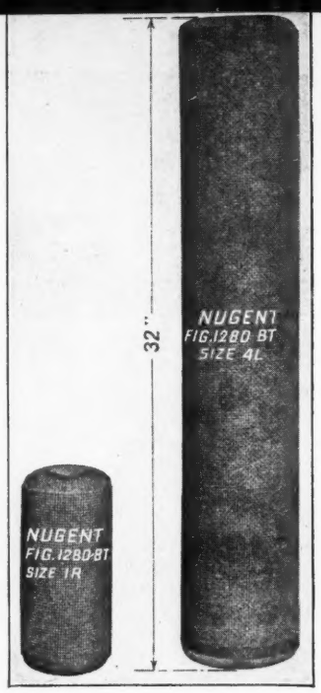




1



2



3

1 CONDENSER — Water cooled Freon condenser gives range of capacities from 5 to 100 tons each, net refrigeration effect. Constructed of a seamless steel shell and steel tubes, with removable cast-iron header which can be arranged for either series or parallel water flow. *Westinghouse Electric & Mfg Co, East Pittsburgh, Pa.*

2 TESTING CHAMBER — Chamber includes apparatus for mechanical refrigerating and electrical heating, and is used for testing instruments under extremes of heat and cold. Consists of two-stage condensing unit, heat exchanger, liquid sub-cooler, coiler or evaporator, etc. *American Coils, Inc, Newark, N. J.*

HOSE, PACKING AND PAINTS

AND

LUBRICATING

COVERED CONDUIT—Plastic skin over metal conduit protects the conduit itself and the wires inside against wear abrasion, heat and most solvents, including gasoline and oil. *Searle Aero Industries, Inc, Orange, Calif.*

3 FILTER RECHARGE—Inexpensive recharge for absorbent type fuel and lubricating-oil filter is inserted in filter cage instead of hand packing loose waste. When dirty recharge is removed from cage by turning filter shell and cage upside down. *W W Nugent & Co, 410 N Hermitage Ave, Chicago, Ill.*

4 COOLANT STRAINER—Strainer on all coolant system machines will strain metal chips and cuttings remaining in suspension, permitting only chip-free cooling solution to pass through pump. Saves general wear and tear on pumps and oil. *Metal Textile Corp, Orange, N. J.*

5 LUBRICATOR — Steam-cylinder lubricator designed for occasional lubrication of steam cylinders with a graphite-beeswax compound where regular steam-cylinder oil is objectionable. Lubricator used extensively on steam lines of steam-driven pumps, fans, engines, generating sets, winches, hoists and other industrial and marine auxiliaries. *Swift Lubricator Co, 330 James Bldg, Elmira, N. Y.*

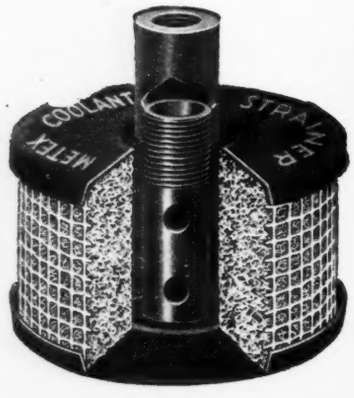
6 OIL CLARIFIER—High-flow oil clarifier will remove abrasives from cutting and honing oils and coolants at high rate of speed. Operation cycle of unit is completely automatic, and unit is self cleaning. Manufactured in three sizes having a capacity of from 60 to 100 gpm. *Honan-Crane Corp, Lebanon, Ind.*

7 OIL PURIFIER—Illustrated is view of recently improved design of this oil-purifying unit. "Continuous" oil purifier will remove acids, sludge abrasives and all forms of contamination from diesel or gas-engine lubricating oils, turbine or hydroelectric generator oils, cutting oils, and all types of industrial oils. *Honan-Crane Corp, Lebanon, Ind.*

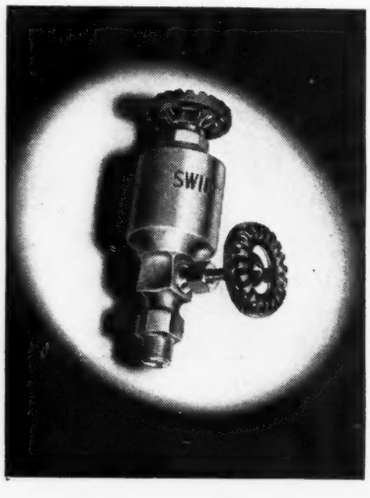
8 AUTOMATIC OILERS—Automatic oilers for elevator door checks installed to prevent waste of large quantities of oil, to eliminate cleaning and decorating expense, and to eliminate fire hazard. Bottle tells at a glance when refilling is necessary. *Trico Fuse Mfg Co, 2950 N 5th St, Milwaukee, Wis.*

9 LUBRICATOR — Constant-level lubricator is positive and automatic operating. When reservoir *A* is filled with oil and inverted on its base *B*, only

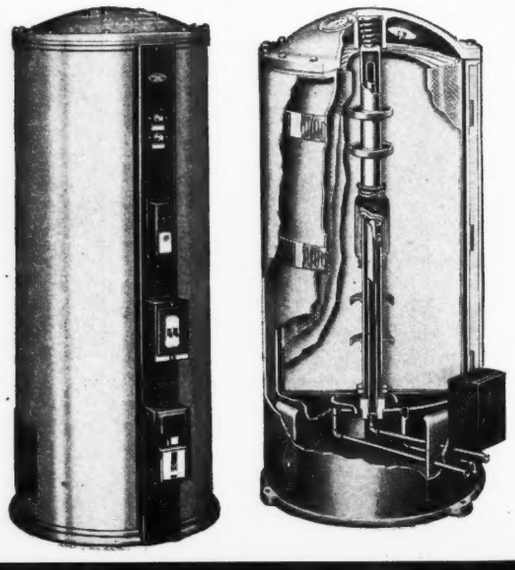
4

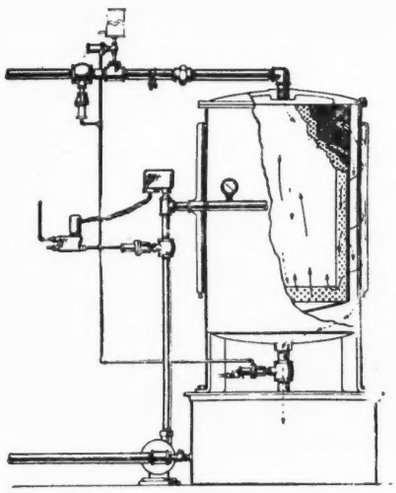


5

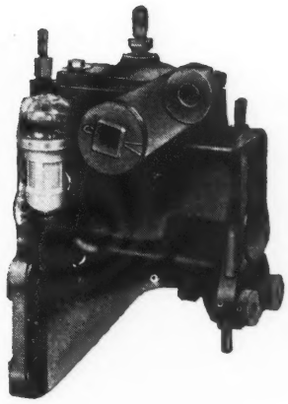


6

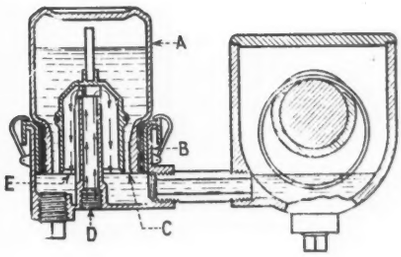




7



8



9

enough will be released to maintain the required level. When oil has been used, the liquid seal at reservoir mouth *C* and edge of dome *E*, is broken, and air is admitted *D*, to the reservoir, forcing oil down to required level. *Oil-Rite Corp, Milwaukee, Wis.*

10 LOOSE-PULLEY OILER—Oiler is for use on loose pulleys, idler pulleys, clutches, eccentrics, and similar rotating machine parts. Designed to deliver a constant, positive and regulated amount of filtered oil to shaft or bearing while pulley is in operation, and to prevent oil waste when pulley is idle. *Oil-Rite Corp, Milwaukee, Wis.*

11 OIL SEALS—Grakone oil seals are made from synthetic rubber to meet individual packing requirements of medium pressure, temperature, speed and type of equipment. Sealing member, mounted in one-piece metal housing, has a lip that maintains contact without use of cumbersome springs. *Graton & Knight Co, 357 Franklin St, Worcester, Mass.*

12 CLARIFIER—Automatic clarifier is for removing abrasives from oils, and cycle of operation is entirely automatic. Clarifier is self cleaning and oil used for cleaning filter screen is separated from mud and returned to system. *Honan-Crane Corp, Lebanon, Ind.*

PORTABLE SERVICE STATIONS — Units are complete lubrication departments ready for instant operation, for mounting on hand or electric trucks for on-the-spot lubrication of equipment in all parts of the plant. All models supplied with air compressor or with air hose on reel for quick connection to plant air lines. *Alemite Div, Stewart Warner Corp, 1800 Diversey, Chicago, Ill.*

NATURAL GRAPHITE — Hydrite contains 22% by weight of colloidal natural graphite dispersed and in complete suspension in water. Contains no oil, alkali or chemical, and has no effect on rubber. Said to be inhibitor and unaffected by acids, acid fumes or vapors. *National Graphite Co, 17 John St, New York, N. Y.*

LUBRICATING SYSTEM — Lincoln system consists of a number of injectors, one for each bearing to be lubricated, each connected to bearing by tubing or high-pressure hose as required, and each individually adjusted to discharge required amount of lubricant. Pumping unit is new 2-part Centro-Matic pump. *Lincoln Engineering Co, 5701 Natural Bridge Ave, St. Louis, Mo.*

FILTER — Frantz Ferrofilter, designated as PQ-6, has been enlarged. New model has 200-gpm capacity with a 3-in. pipe connection. Unit has no moving parts. *S G Frantz Co, 161 Grand St, New York, N. Y.*

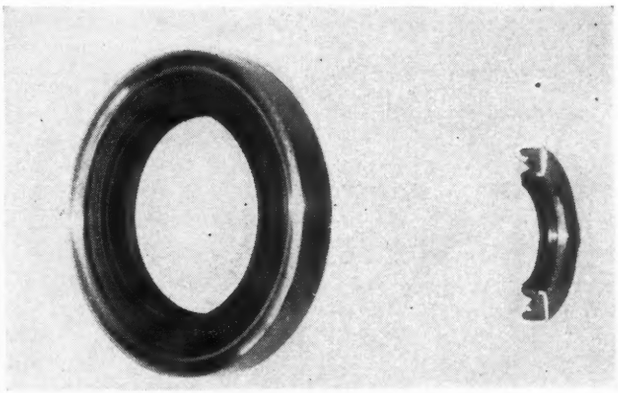
COLLOIDAL GRAPHITE — Konag natural colloidal graphite is available with lubricating oil, light fuel oil, diesel break-in oil, in grease etc. Provided in five combinations: Konag Lube, Konag A, Konag B, Konag C and Konag D. *National Graphite Co, 17 John St, New York, N. Y.*

STACK COATING—Corrosion and heat-resistant stack coating will withstand temperatures up to 900 F without sagging or deterioration in any way, according to maker. Gives protection against corrosive atmospheres, and materials including acids, alkalis, sulphur fumes, by-product gases, salt air or water. *Carbozite Corp, Pittsburgh, Pa.*

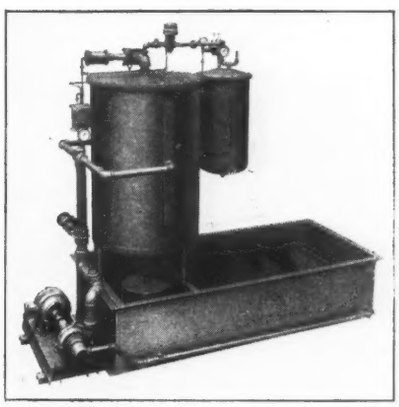
INSULATION—Material is made in form of a seamless braided tube of long-fibre asbestos with a wall thickness of ½ in. In applying, insulation is slipped on before assembly and is clamped at either end after being stretched tightly lengthwise on the pipe. *Union Asbestos & Rubber Co, S 54th Ave, Cicero, Ill.*

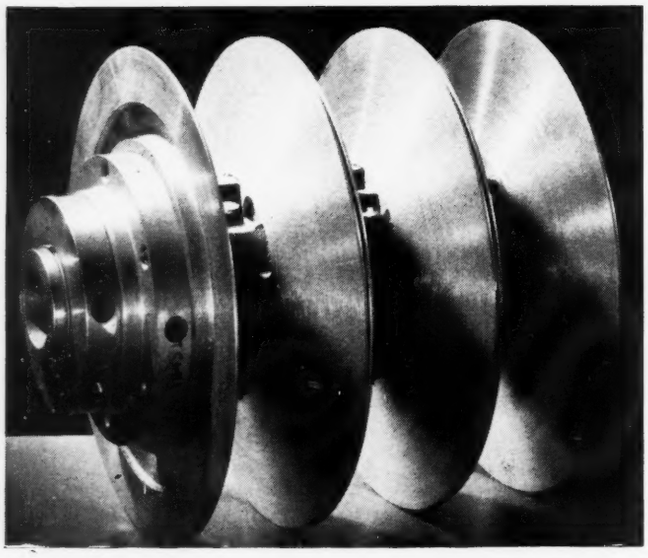
10

11

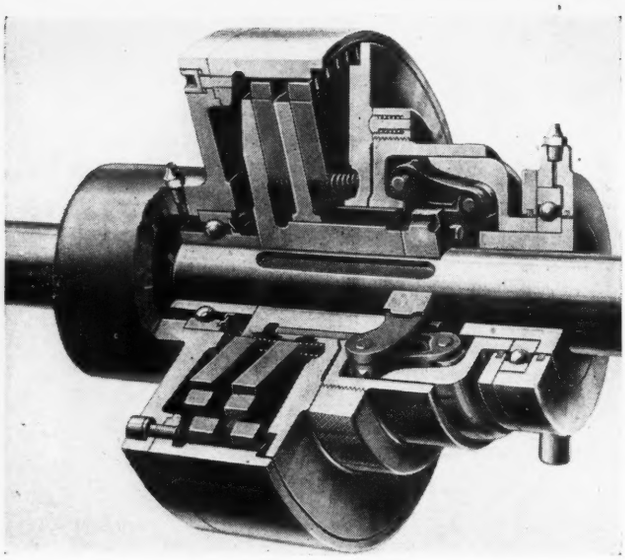


12





1



2

BUILDERS' PLASTIC — Wet-X-Hale builders' plastic is oil base portland cement product, combined with various indestructible fine aggregates. Can be applied to rusty steel surfaces without a primer. Said to be unaffected or penetrated by moisture, rain, salt-water spray, hot sun rays, etc. *Rogear Co, 11 Water St, New York, N. Y.*

INSULATING VARNISH — Designated as S-110, varnish is for application to electrical apparatus that must operate at abnormally high temperatures. Tests have indicated that S-110 will stand operating temperatures of 250 C or higher manufacturer states. *Sterling Varnish Co, 165 Ohio River Blvd, Haysville, Pa.*

CABLE PAINT — No. 737 cable paint is oil and waterproof, extremely flexible and flame resistant one hour after application to cable. Said to be highly resistant to corrosive fumes and heat. *John C Dolph Co, Newark, N. J.*

PAINT SELECTOR — Valdura paint selector is handy means of selecting the best paint without detailed study of properties of all finishes that might be suitable for a given application. Selector makes available all information on properties of, and all application data necessary to choose properly from 43 paint, enamel and varnish products. *American-Marietta Co, 45 E Ohio St, Chicago, Ill.*

INSULATING VARNISH — Flame-resistant insulating varnish designated R-878 is recommended for class B high-temperature insulation. New varnish said to be mechanically strong and to dry all the way through when applied to electrical apparatus. In addition to good heat-resisting qualities it is said to have characteristics of high-grade insulating varnish. *Sterling Varnish Co, 165 Ohio River Blvd, Haysville, Pa.*

BLACKOUT COATING — Coating is smooth flowing liquid, manufactured from pyrobitumen ore, refined and mixed with quick-drying volatile solvents, and an ingredient which provides opacity and gloss-free surface. *Carbozite Corp, First National Bank Bldg, Pittsburgh, Pa.*

PROTECTIVE COATING — Resiflex protective coating, a transparent resin with an unusual combination of properties for protecting metal, wood, fabric, paper and composition material, may be adjusted to accent one or more of the following properties: dielectric strength; resistance to alkalies, inorganic acids, alcohols, gasoline and oils; or flexibility and stretch resistance. *David C Brown Co, 17532 Wisconsin, Detroit, Mich.*

BLACKOUT PAINT — Vita-Var blackout paint forms a tough elastic film that will not wash off in rain. Said not to be affected by atmospheric conditions or by moisture and temperature conditions inside plant. *Vita-Var Corp, Newark, N. J.*

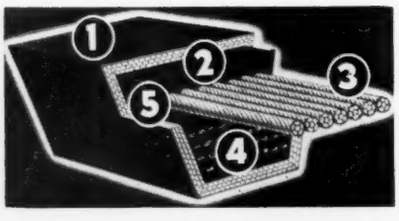
MECHANICAL TRANSMISSION, MATERIALS HANDLING

1 VARI-PITCH SHEAVE — Speed variations of from 66% to 116% possible with new sheave added to line. New unit is used with companion sheave grooved for wide Texrope V-Belts. Sheaves manufactured in sizes to fit shafts of all standard NEMA motors from fractional to 30 hp. *Allis-Chalmers Mfg Co, Milwaukee, Wis.*

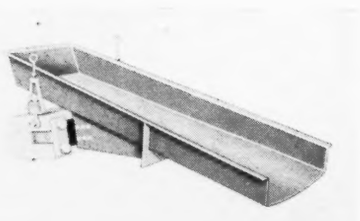
2 CLUTCH — Torque-master friction clutch available in single and multiple-disk types in wide range of sizes. Designed for impact and pulsating loads. As indicated in illustration, friction plates are of gear-tooth design, while entire operating mechanism consists of only a few moving parts. All wear or load adjustments can be made with one knurled ring. *T B Wood's Sons Co, Chambersburg, Pa.*

3 V-BELTS — Multiple-V-Belt line has been changed and belts now have black cover that insures longer wear, more uniform pull and higher resistance to heat,

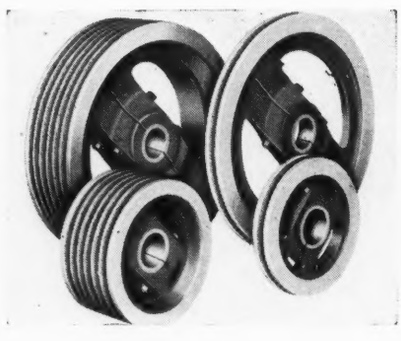
3

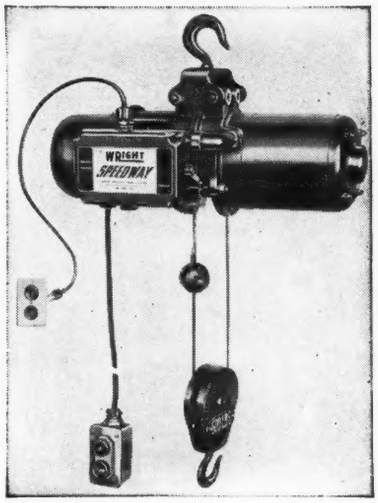


4

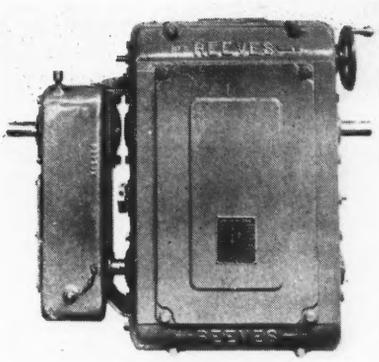


5

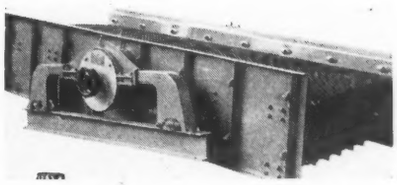




6



7



8

oil, etc, according to maker. Illustration is numbered to show various parts. No. 1 shows heavy, tough black cover with uniform friction, longer life, (2) tension section, (3) neutral frames with heavy endless load-carrying cord, (4) compression section, and (5) insulating duck. *Goodyear Tire & Rubber Co, Akron, Ohio.*

4 FEEDERS—Syntron vibratory feeders announced in larger sizes. New models, F-4 and F-5 have capacities of 100 and 500 tons per hour, respectively. Model F-4, illustrated, carries pans as long as 60 in. New models, like smaller capacity units, are vibrated at high speed by pulsating electromagnets. *Syntron Co, 492 Lexington Ave, Homer City, Pa.*

5 WOOD SHEAVE—Wood sheave for V-Belt drives is offered as an alternate for metal sheaves. Efficiency of this sheave is equal in every way to that of metal sheaves, except where flywheel effect is essential, maker states. Sheave is of laminated construction and segments are selected straight-grain kiln-dried hard maple. Wood bushings provided and provision made for firm fastening to shaft. *Dodge Mfg Co, Mishawaka, Ind.*

6 ELECTRIC HOIST — Speedway wire rope electric hoist, recently added to line, obtainable in capacities from 250 to 1000 lb. Has pushbutton control, weather-, acid-, and dust-proof preformed hoisting cable on drum winding, eliminating slack chain fouling loads, safety limit switches, and safety load blocks. *Wright Mfg Div, York, Pa.*

7 VARIABLE-SPEED REDUCER—Special design of Reeves variable-speed transmission, enclosed type, is equipped with built-in chain reducer, with output and input shafts in exact alignment. Output speeds may be increased or decreased as compared to the variable-speed shaft of the transmission and are infinitely variable within predetermined limits. *Reeves Pulley Co, 76 Dey St, New York, N. Y.*

8 VIBRATING SCREEN—Style M high-speed unbalanced-pulley-type vibrating screen will stand up to overloads, according to maker. Oil-lubricated bearings are super-sealed by double-action flingers and welded splash and dust guards. Screen inclination, amplitude of vibration and operating speeds may be varied to obtain maximum flexibility. *Robins Conveying Belt Co, Passaic, N. J.*

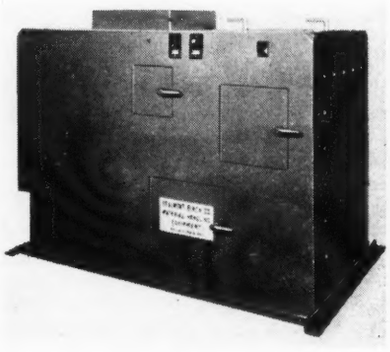
9 SCALE — Automatic weighing scale designed for rapid and accurate handling of coal and other free-flowing bulk materials. Has a vibrating metal feeder deck which conveys the material from feed hopper to weighing hopper, thereby eliminating all rubber belts, pulleys and rotating mechanism. Available in three standard units from 1 to 30 tons per hour. Larger sizes can be furnished. *Beaumont Birch Co, Philadelphia, Pa.*

10 POWER TRUCKS — New trucks lift from 2000 to 7000 lb, using an hydraulic vane-type pump driven by a special series-wound motor. Drive axle is Clark special double-reduction gear and pinion, mounted on ball and roller bearings. Standard equipment includes hydraulic brakes, centrally located control levers, spring-mounted rubber-cushioned seats, disk wheel and electric horn. *Clark Tructractor Div, Clark Equipment Co, Battle Creek, Mich.*

11 ANGLE DRIVE — Mitre gear drive with a 1:1 ration is for changing the direction of any shaft through an angle of 90 deg. Driving or driven shafts may be set to operate in either horizontal or vertical position, for floor, wall or ceiling mounting, universal base being provided for any such position. *Payne-Dean, Peekskill, N. Y.*

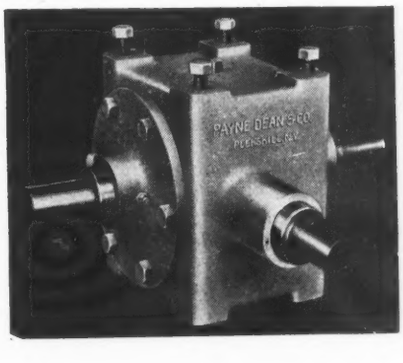
WOOD BEARING — Woodex is trade name of wood made from selected portions of sap rock maple, impregnated with various oils and other lubricants. Furnished in the form of bearings and formed-to-size parts, it can be machined easily. Maker says that while Woodex will not stand the load, speed or high temperatures that graphited bronzes will, it will outwear most metals when installed in

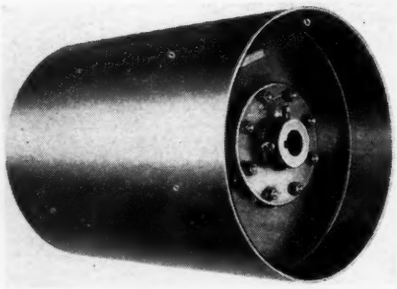
9



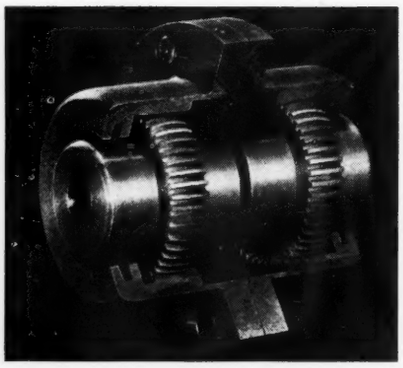
10

11

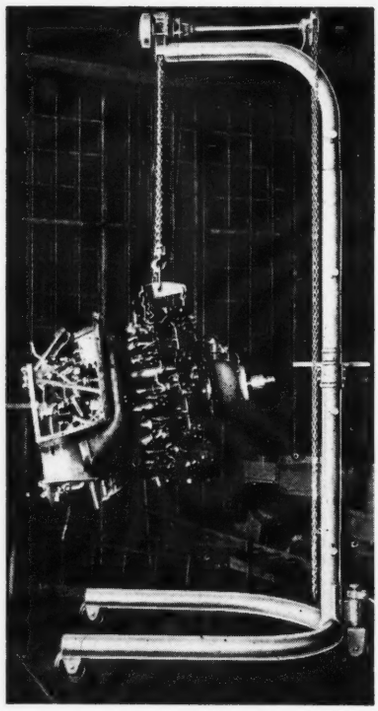




1



2



3

applications for which it is intended. Neveroil Bearing Co, Wakefield, Mass.

RUBBER PLASTIC — Rubber plastic for conveyor belts, pulleys and other equipment repairs holes and worn spots, making it possible for plant to keep operating without loss of time or replacement of equipment now in service. Material, a putty-like substance, contains only a small proportion of crude rubber; average repair made on conveyor belt or similar application contains less than 1/48 of an ounce of rubber according to manufacturer. *So-Lo Works, Cincinnati, Ohio.*

BEARING METAL—Babbitt metal is for bearings subject to high pressures and temperatures. Known as Power Nickel Genuine Babbitt, this metal has tensile strength of 17,800 psi, a yield point of 6500, Brinnell hardness of 27 and a pouring temperature of from 950 to 1000 F. Nickel treatment gives metal a hard glossy surface, desirable for generators, motors and high-speed applications. *Magnolia Metal Co, 120 Bayway, Eliz., N. J.*

BALL AND ROLLER BEARING COVERS—With approval of all leading manufacturers of ball and roller bearings, standard covers in complete range of types and sizes have been developed for forming dust and grease-tight closures to bearing housing. Low unit cost in small or large quantities, saving of costly "nuisance" setups, reduction in designing, drafting, detailing and checking time, as well as entire elimination of costs of patterns, fixtures, etc, are chief advantages. *R-S Products Corp, 4530 Germantown Ave, Philadelphia, Pa.*

BELT PILER—Portable piler is designed for handling materials from boxcars, etc. Carrier can be raised and lowered by a hand crank on the side of the equipment. Has safe maximum piling height of 8 ft, but will pile up to 10 ft. Provided with rough-top belting to minimize slipping. *National Conveyor Co, N St Paul, Minn.*

CHAIN-TYPE CONVEYOR — New chain-type conveyor consists of steel-tubular track with a continuous chain made up of vertical and horizontal wheel units. Vertical wheels are connected by an axle through side plates of unit frame; horizontal unit is made of wheel and link, wheel bearing on inside track when rolling around a horizontal curve. Vertical units carry the load, ride bottom of track on horizontal run, roll under track top on vertical curves turning upward or straightening out from downward to horizontal movement. Two sets of wheels keep chain assembly in centerline of track. *Richards-Wilcox Mfg Co, Aurora, Ill.*

IRON BEARING — Company announces selflube porous iron bearings in addition to line of self-lubricating bronze bearings. New porous iron bearings are stronger than the bronze units and are interchangeable with them in most applications. Iron bearings made from powdered iron, which is molded to size in the shape desired, baked, then saturated with oil. Have average porosity of 25 to 35%, enabling them to store a large amount of oil which forms a protective, continuous oil film on the bearing surface. *Keystone Carbon Co, St Marys, Pa.*

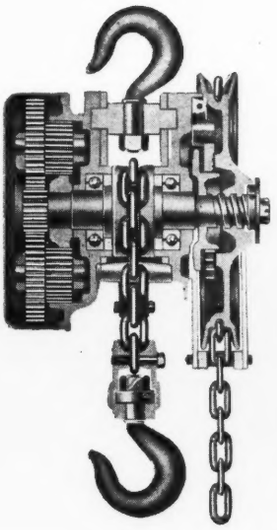
BABBITT SUBSTITUTE — Two lead-base bearing metals known as pyramid and Defender have been developed as substitutes for tin-base babbitts. Pyramid may be applied where bearings must sustain heavy pressures, and Defender metal stands shocks without cracking, and is well suited for use in internal-combustion engines, tap-rock crushers and shifter machinery. For uniform loads found on pumps and general machinery, makers recommend Magnolia anti-friction metal. *Magnolia Metal Co, 120 Bayway, Elizabeth, N. J.*

1 SOLID CONVEYOR PULLEY—Type N solid conveyor pulley is made with tight ends and is easily kept clean, according to maker. No spilled materials, dust or water can accumulate inside pulley. Pulley is of rolled steel, light in weight and practically unbreakable. Removable interchangeable hubs assure quick, easy mounting. Pulley diameters are from 6 to 36 in. *American Pulley Co, Wissahickon Ave, Philadelphia, Pa.*

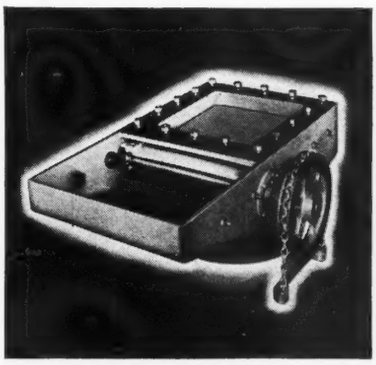
2 GEAR COUPLING—Barcus gear coupling for driving and driven shafts comprises a cylindrical housing shell cut with internal gears having stub teeth with 20-deg pressure angle. Driving and driven shafts are respectively connected to hubs of generated gears each cut on a true central segment of a sphere, surface of teeth being of constant width throughout their length. Teeth of each spherical gear meshing in stub teeth of housing produces smooth ball action contributing to reduction of friction and pressure on shaft bearings if shafts are out of alignment. Nature of spherical gear permits misalignment up to 3 deg on either shaft or a total misalignment up to 6 deg. *John Barcus Engineering Co, 3931 Falls Rd, Baltimore, Md.*

3 PORTABLE HOIST — Portable hoist, originally designed for aviation industry, has found numerous applications in general industrial applications. Has single upright mast equipped with riser steps and an adjustable platform. Chain hoist raises and lowers the work, or supports it at any desired level, and an extension keeps chain safely away from load. Brake locks hoist in position. Available in 1- and 2-ton models. *Aviation Dept, Whiting Corp, Harvey, Ill.*

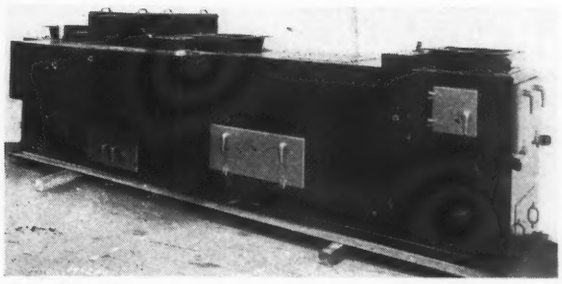
4 CHAIN HOIST — Improved standard spur gear chain hoist is equipped with guard to protect Weston brake from dust and dirt. Heavy suspension plates



4



5



6

provide unbreakable support between top hook crosshead and load sheave. These plates also support the saddle for double-chain hookup, an entirely new feature in this hoist, and eliminate the use of a top yoke, reducing weight and headroom and permitting hoist to hang evenly at all times. *Coffing Hoist Co, Danville, Ill.*

5 COAL VALVES—New series of coal valves range in size from 14 to 20-in. openings. Corrosion - resistant cast - iron valves suited for installation in chutes feeding coal to pulverizers or stokers. Valves can be operated easily even when discharge chute is plugged. Units equipped with 12-in. ragwheel, and 10 ft of chain. *Beaumont Birch Co, Philadelphia, Pa.*

6 COAL SCALES — Illustration shows 16-ft scale with three separate inlet openings or bunker connections. At one end is shorter conveyor of 4-ft centers which receives coal from one bunker opening and delivers coal to weighing hopper. *Richardson Scale Co, Clifton, N. J.*

ROPE SLINGS — "Flatweave" non-spiraling sling developed specifically for lifting light and medium loads where legs choke load or sling comes in direct contact with load being lifted. Body is made up of six separate ropes. Same safe loads can be allowed with loops as with socketed ends. Loops, which can be used as chokers without the use of thimbles, easily slip over crane hooks or lifting lugs. *John A Roebling's Sons Co, Trenton, N. J.*

BEARING WASHER—Production-type bearing washer for industrial-plant use has been developed so that bearings can be washed and thoroughly dried for periodical inspection and then repacked with fresh lubricant. Unit is easily portable and has sealed compartment to prevent evaporation loss of solvent solution. Provision is made for compressed-air dryer which blows bearings dry and clean, making the whole operation complete in a minimum of time. Additional unit for repacking cleaned bearing with fresh grease available. *Ahlberg Bearing Co, 3073 West 47th St, Chicago, Ill.*

DRUM CONTROLLER—New line of drum controllers for small cranes and hoists announced. Rope operating lever, using new equalizing torque principle, eliminates cumbersome sheave, rope guard and external return spring, providing smooth operation even when rope is pulled at an angle. New anti-plug feature increases drum life by making it impossible to whip drum from full forward to full reverse position. *Cutler-Hammer, Inc, Milwaukee, Wis.*

IDLER—Self-aligning idler for flat conveyor belts, both return and carrying, said to help keep belt central on its supporting idlers. Units have no side guide rolls to impose unnecessary wear on belt edge. *Chain Belt Co, 1600 W Bruce St, Milwaukee, Wis.*

VARIABLE-SPEED DRIVE—Variable-speed multi-V-belt drive announced by company. Model A "Allspeed Drive" has hp range of from ⅓ to ¾, with a speed ratio of 16 to 1; that is, any speed from ⅛ to twice driving motor speed. Drive said to be exceptionally compact, ball-bearing equipped and so designed that it can be operated in any plane. Can be directly coupled to any standard motor and output shaft can be run at motor speed. *Worthington Pump & Machinery Corp, Harrison, N. J.*

SCREEN—Robins Gyrex screen has been refined to obtain the utmost in reliability and increase still further the expected life of such items as bearings, springs, and screen cloth, maker says. Improved screen now includes such features as: amplified steel to conserve lubricants and to protect bearings against entrance of dirt; shock-absorbing supporting springs to take impact of live loads; and spring-tension cushion-mounted screen cloth to prevent wire breakage. *Robins Conveying Belt Co, Passaic, N. J.*

BELT DRESSING—Belt-Life made to transmit full power from motors to machines, raising belt efficiency from 50 to 95%, it is claimed. Belt-Life prevents restitching, avoids excessive pressures on shaft bearer, preserves all sorts of driving belts, cleanses belt pores thoroughly and prevents slipping, maker says. Belt-Life is guaranteed free from mineral oils, etc, which cause belt deterioration, maker says. *Belt Oil & Chemical Co, 1265 Broadway, New York, N. Y.*

METERS AND INSTRUMENTS

PRESSURE-INDICATING GAGES — Developed for use in pressure-indicating gages, new type of gearing is made in form of patent cam and roller movement. This movement employs a sector-shaped driving cam and a driven helical roller. One end of pivoted cam links to tip of Bourdon tube, while other is aligned with and fits freely into roller thread. Hair spring limits point of contact between cam and roller to only one side of each element, and prevents backlash, according to manufacturer. *Certified Gauge & Instrument Corp, Long Island City, N. Y.*

CONTROLLER—Model 30 Stabilog controller appears in new universal rectangular case. Dual pressure indicator, replacing customary two small gages, is seen through rectangular opening in door. All operating adjustments made from case front, adjusting mechanism for change of control point, throttling range and reset resistance being immediately accessible when door is opened. *Foxboro Co, Foxboro, Mass.*

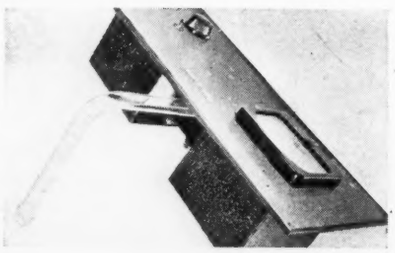
1 COLORIMETER — Model 400-S designed to register light transmission of a liquid passing continuously through instrument. Operating principle of this instrument is similar to that of usual photoelectric colorimeter. Light from incandescent lamp passes through a color filter and through the liquid, then impinges on a barrier-layer photocell, the current of which is registered by an electrical indicating instrument. Distinctive feature of continuous-flow colorimeter lies in that liquid under test passes through glass tube rather than being contained in absorption cell or test tube. This makes instrument suitable for chemical processes in which color or turbidity must be checked continuously. *Photovolt Corp, 95 Madison Ave, New York, N. Y.*

2 COLORIMETER—Lumetron Model 400 features portability, simplicity of operation and low price. Built in wooden housing with cover and carrying strap to facilitate its use in laboratory as well as plant. Readings are definite and independent of operator's judgment, and no standard solutions are required at any time in routine work. Operates from any ac or dc 110-volt outlet, and is claimed to be easy in operation. *Photovolt Corp, 95 Madison Ave, New York, N. Y.*

3 ULTRA - HIGH - PRESSURE FLOWMETER — Special adaptation of ring balance (tilting U-tube) which has no float, stuffing box or pressure-tight bearing, offers accuracy, freedom from maintenance and safety for high-pressure-flow measurements. Mercury-sealed manometer, stainless-steel ring, is balanced on knife edges. Sold stainless-steel block drilled for pressure connections forms partition at ring top. Nickel tubing connects ring top to rotation center, joining free ends of twin 6-in. nickel torsion tubes. Outboard ends of torsion tubes are anchored; pressure lines from primary elements connect to these. Ring tilts 10 deg for the full differential range measurement (between 4 and 9 in. Hg, depending on cam weight supplied). *Cochrane Corp, 17th & Allegheny, Philadelphia, Pa.*

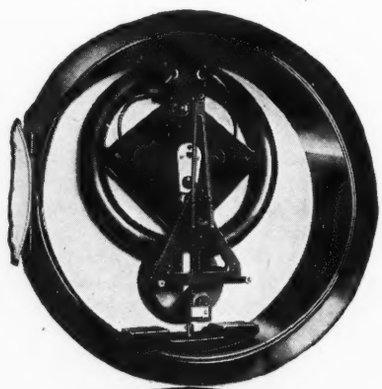
4 NON-INDICATING CONTROLLER — "Tag" No. 42 has basically the same movement as Tag control, redesigned for compactness in such a fashion that the

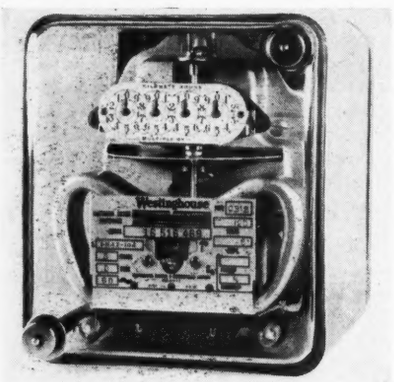
1



2

3





4

5

few simple parts are accessible. Small size does not affect interchangeability of tube systems. Smallest change in temperature is transmitted positively to ball air valve through novel transmitting spring lever that multiplies movement of capsular spring. Air valve in turn resets rate of flow through diaphragm-actuated control valve. *C J Tagliabue Mfg Co, Park & Nostrand Ave, Brooklyn, N. Y.*

5 WATTHOUR METER—Type CB watthour meters are for industrial and central station use. Mounting styles are flush, projection and a detachable or plug-in construction. Detachable models can be readily removed for over-all inspection and test without interrupting circuit. All calibration adjustments accessible from front when molded glass covers are removed. *Westinghouse Electric & Mfg Co, East Pittsburgh, Pa.*

6 TIMING DEVICE—Tandem timer permits practically any timing sequence desired. Consists essentially of a control unit with two individual and variable plug-in timing elements. With timing elements adjusted to their correct respective time intervals, each cycle will follow the other continuously in regular sequence. When timer dials are once set at time interval desired, further adjustments are unnecessary until a new sequence is required. Automatic reset features make a continuous as well as a single-cycle operation possible. *Industrial Timer Corp, 113 Edison Place, Newark, N. J.*

7 pH RECORDER—Multi-point recorder simultaneously records pH at separate and independent points in a closed fluid system. Photograph shows actual record from condensate system of large utility generating plant where this system is in operation. Instrument which provides pH record at different stages in a process or treating operation incorporates an advance circuit design and permits installation of the measuring electrodes at separate and independent sampling points in the plant. *Cambridge Instrument Co, Grand Central Terminal, New York, N. Y.*

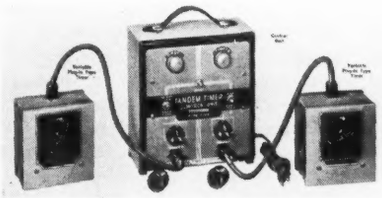
8 GAGE TESTER — Grove gage comparator permits service gages to be quickly and accurately tested in place

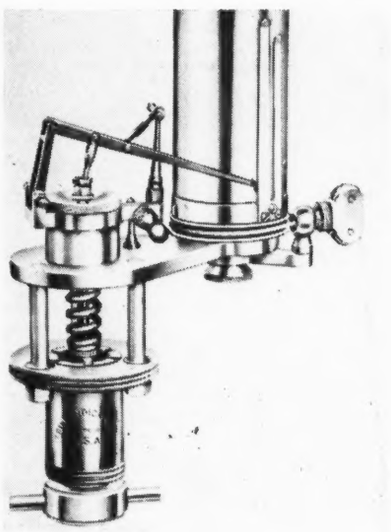
without breaking line connections, in a fraction of the time usually required, according to the company. Time-saving feature of comparator is particularly valuable and important whenever these is the slightest possibility of the gage having been damaged by momentary or sustained overpressure release, extreme vibration or shock of any sort. Necessary testing pressures supplied from built-in high-capacity air cylinders which can be charged and recharged as often as necessary with clean dry gas, air or oxygen. Fine degree of pressure control possible. *Grove Regulator Co, Oakland, Calif.*

9 MARINE-ENGINE INDICATOR — Trill indicator embodies design features that assure continuously accurate indicating of Liberty ship's reciprocating steam engines under today's operating conditions. Indicator spring is located outside and can be easily attached and replaced. Use of this indicator provides operator with engine-performance diagram which acts as guide to necessary adjustments or repairs. This prevents breakdowns, saves time and money and keeps engine running for longest possible time at highest degree of efficiency. *Trill Indicator Co, Pittsburgh, Pa.*

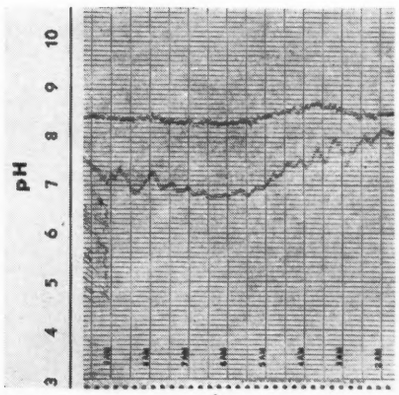
STRAIN GAGE — Recent development used for detecting and indicating strains in industrial machinery. Comprising a rod, lever arm and head, gage looks like side view of an automobile jack. Rod is fastened at either end to the machine in the direction of the strain. Lever arm, attached at its outer end to the machine, is at right angles to the rod. Gage head consists of an armature operating within two coils. Before job is started, position of armature within coils is so adjusted that a zero reading is registered on a connecting instrument. When machine is put in operation and strain exerted, rod pulls down on lever arm. Arm in turn pulls down on a pin in the armature and moves armature to new position within the coils. This affects the electromagnetic relationship between armature and coils in accordance with amount of strain exerted. Instrument, previously calibrated against known strain loads, then indicates extent of unknown strain. *General Electric Co, Schenectady, N. Y.*

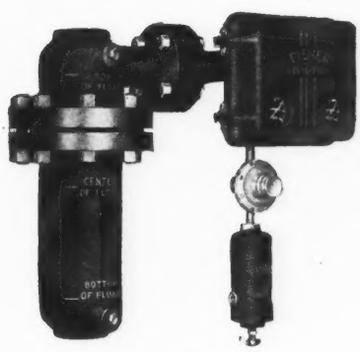
6



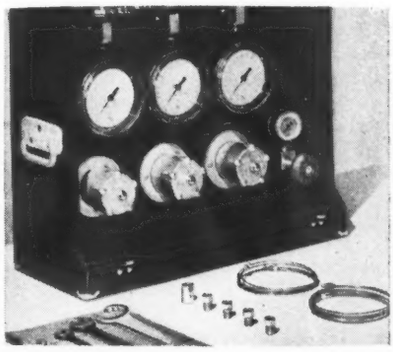


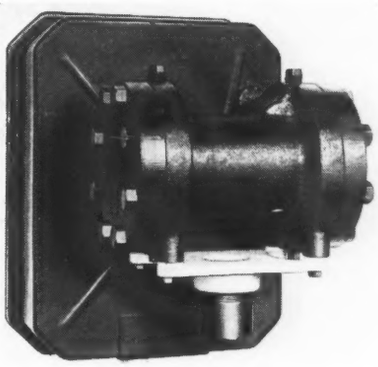
7





8





9

10

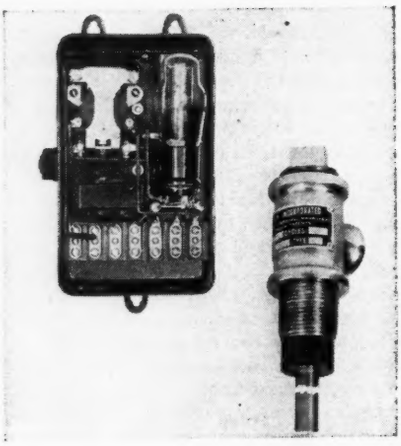
11

10 DISPLACEMENT LEVEL-TROL — Displacement-type level-trol features greater sensitivity speed of action, freedom from service trouble and ease of adjustment. Available in float-cage or internal-float type construction for handling all liquids at all pressures, temperatures and specific gravities. Pilot is 100% pneumatic in operation — all linkage pivot points and other sources of friction have been eliminated, reducing operating power to a minimum. New features include Inconel torque-tube construction that eliminates stuffing-box packing. *Fisher Governor Co, Marshalltown, Iowa.*

11 MANOMETER — Absence of mercury or other liquid from this latest development of company removes possibility, according to the maker, of product contamination and hazard of mercury being blown because of line surges or carelessness. Further advantages are that sealing liquids are rarely required and that mercury is released for war effort. Available for all indicating and recording meters and controllers, and is supplied for standard ranges between 20 and 500 in. of water. *Taylor Instrument Companies, Rochester, N. Y.*

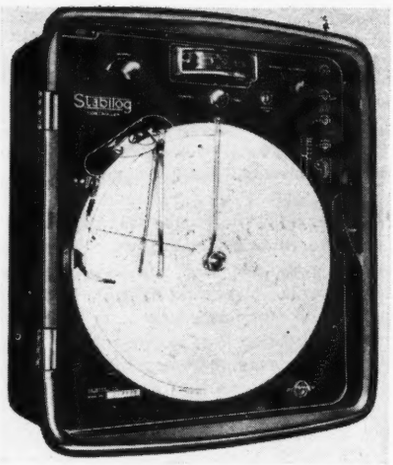
METER TESTER — In addition to testing watthour meters, device can be used for checking accuracy of rotating standards by the primary-standard method. Unit features electric circuit which requires no adjustment and remains unaffected by ordinary room lighting or stray light. *General Electric Co, Schenectady, N. Y.*

TIMER — Recent design improvements have increased performance characteristics on Series 2800 "Vernier-Set" timers. Standard features of telechron motor, simple knob setting without locking device, silver contacts and hand adjustments to slides and bridges now augmented with: (1) 1-piece molded bakelite terminal block accommodating all external wiring to clearly marked screw post terminals as well as bridge positions for easy selection of desired arrangement; (2) leaf-spring contact for positive make-break action; (3) timer and load circuits wired independently; and (4) flaminol and flexible wiring throughout. *Automatic Temperature Control Co, 34 East Logan St, Philadelphia, Pa.*



1

2



3

FLOOR TREATMENT — "Colorflex-plus" floor treatment cleans, colors, and preserves floors—wood, concrete, new or old. Consists of cleaner and dye-like coloring. Cleaner conditions the floors by removing dirt, grime, and grease, and neutralizes the excess alkalinity in concrete, while coloring forms perfect affinity with floor. *Flexrock Co, Philadelphia, Pa.*

LEVEL CONTROL — Magnetrol unit is addition to present line. Flow alarm consists of full-ported globe valve body to which is attached Magnetrol switching arrangement. Switch head and valve-piston assembly are attached to valve body by union bonnet nut making removal for inspection easy. *Automatic Control Div, Fred H Schaub Engrg Co, 325 W Huron St, Chicago, Ill.*

SUBMARINE THERMOMETER — Taylor 5-in. industrial thermometer is designed for limited space or on equipment subject to vibration. Designed for Navy use, this unit lends itself to diesel engines, air compressors, lubricating lines on motors, generators or reduction gears, etc. Available in straight, angle, right-side angle, left-side angle and oblique stem to afford best angle of vision. *Taylor Instrument Companies, Rochester, N. Y.*

1 WATER DETECTOR — Photoswitch Type PI5NH is designed to indicate water seepage in gasoline storage tanks. Probe on water detector extends down to about 3-in. from tank bottom, and is wired to instrument some distance from tank. When water rises in tank it completes circuit in detector and sounds alarm while stopping pumping equipment. *Photoswitch, Inc, 21 Chestnut St, Cambridge, Mass.*

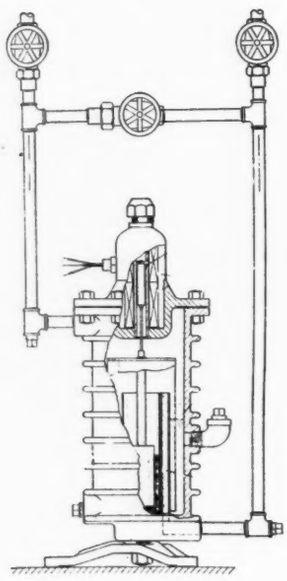
2 WEAR GAGE — Wear gage is for measuring precisely the amount of material removed from metallic surfaces after such surfaces have been subject to wear and abrasion, as in engine cylinders, crankshafts and bearings, cams, etc. Maximum amount of wear that can be measured is 0.0014 in. Minimum is 0.000015 in. *American Instrument Co, Silver Springs, Md.*

3 STABILIZING CONTROL — Hyper-reset is not an instrument or mechanism but control function, available in newly designed Model 30 Stabilog controller for application where process-lag is considerable. Hyper-reset reduces effects of process disturbance by making initial temporary additional corrections, proportional to the rate of change of the measured value caused by the disturbance. *Foxboro Co, Foxboro, Mass.*

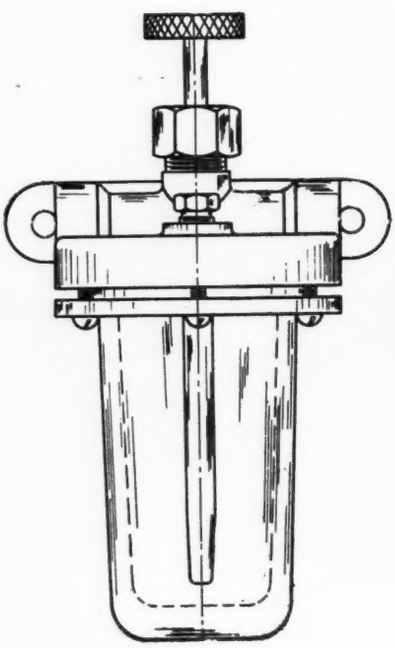
4 TRANSMITTER — Style H transmitter used in conjunction with standard Cochrane electric meter receiving units, is specifically designed for measurement of low static pressure gases where low differential and resultant low permanent pressure loss is important. *Cochrane Corp, Philadelphia, Pa.*

5 BUBBLERS—Sight feed bubblers are for continuous operation of tank liquid-level gages and where a sight indicator is required, to purge lines, giving visible indication of gas flow and to note the presence of harmful or undesirable

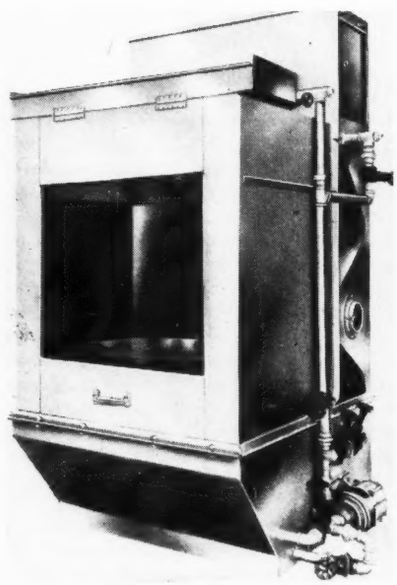
4



5



6



7

8

gases. *The Meriam Co, 1955 W 12th St, Cleveland, Ohio.*

BALANCING MACHINE — Bear Dy-Namic balancing machines operate under new sensitive and accurate balancing principle and indicate disturbing centrifugal force or force coupled with high degree of accuracy. *Bear Mfg Co, Industrial Div, Rock Island, Ill.*

MISCELLANEOUS

OIL TREATMENT—Xzit treatment especially designed to eliminate sludge formed by condensation in oil tanks. Xzit is soluble in oil but not in water, and accomplishes function by decreasing surface tension of oil. *Xzit Sales Co, Clinton St, Hoboken, N. J.*

6 SPRAY BOOTH — Illustration shows single-compartment Aqua-Restor paint spray booth, featuring rear and side water-impingement walls. Makers claim absence of nozzles eliminates clogging. *Mayer Mfg Corp, 45 Division Pl, Brooklyn.*

7 BOMB SNATCHER — Bomb snatcher is, in effect, a pair of tongs with semi-cylindrical jaws which enclose the bomb and hold it as in a cup to prevent molten magnesium or blazing thermite from dripping out. Jaws are lined with high-temperature fire-resisting material. *McGraw Electric Co, W 65th, Chicago.*

8 INSULATION TUBING — Tubing has excellent resistance to brittleness down to −50 C. Transflex is fibronized tubing available from size No. 24 to 1¼ in. ID. Photo shows extreme flexibility. Has tensile strength of 3400-3600 psi; dielectric strength (tubing having wall thickness of 0.020 in.) is 850 VPM when dry and 815 VPM when wet. *Irvington Varnish & Insulator Co, Irvington, N. J.*

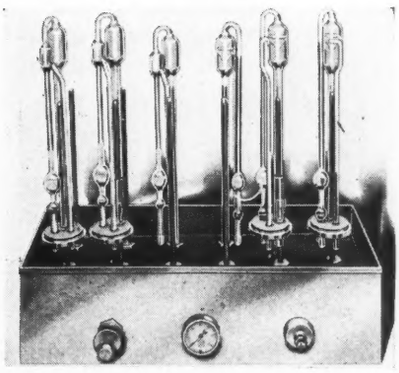
9 STIRRUP PUMP BARREL — Barrel pump extinguisher consists of a 20-gal barrel mounted on wooden wheels for rolling to place of use. Stirrup pump fits into barrel top, and is equipped with hose and nozzle that will allow for spray adjustment. Ax is attached to barrel for emergency use. *Specialties Mfg Co, 35 Farrand St, Bloomfield, N. J.*

10 CLEANING APPARATUS — Cleaning and drying apparatus was designed primarily for glass viscosimeters which determine kinematic viscosity. Equipment adaptable, however, to cleaning other glassware such as test tubes, pipettes, etc. Tubes are placed over and supported by vertically extended metal capillary tubes through which cleaning fluid, (and air under pressure for drying) is passed. *C J Tagliabue Mfg Co, Park & Nostrand Ave, Brooklyn, N. Y.*

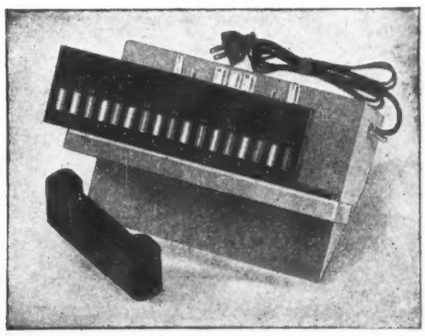
11 MIDGET TESTING LAMP—Although midget Dalite lamp was designed for use with Taylor slide comparators, it has been found ideal for all routine testing even in daylight. Lamp gives uniform daylight conditions at all times. Illustration shows Taylor comparator. *W A Taylor Co, 3300 York Rd, Baltimore, Md.*

9

10



11



FIRE EXTINGUISHER — Company states that this Alfite carbon-dioxide unit is only 100-lb unit approved by Underwriters and Associated Factory Mutual Laboratories for use on both electrical and oil fires. Unit has "Anti-statik" horn to protect operator from static discharge. *American-LaFrance-Foamite Corp, Elmira, N. Y.*

PUMP TANK EXTINGUISHER — Buffalo pump tank extinguisher has been designed to meet hazards of incendiary bombs. A fine water spray or a solid stream provides effective control. Units have dependable double-action pump and large refill opening at top. Extinguishers also may be used with non-freeze solutions for unheated buildings. *Buffalo Fire Appliance Corp, 44 Central Ave, Buffalo, N. Y.*

PLASTIC WINDOW PANE—Pane of transparent plastic with wire mesh will withstand explosion of 150-lb bomb 8 ft away. For use in military construction and industrial plants, material was developed in cooperation with U. S. Navy to reduce menace of flying glass. *Plastics Div, Monsanto Chemical Co, Springfield, Mass.*

RUBBER PUTTY—Plastikon is rubber-base putty having unusual properties which make it suitable for many types of glazing and sealing. Said to be permanent, watertight and airtight. Solidifies and shrinks slightly, but does not become brittle, says maker. Withstands vibration, expansion and contraction. *B B Goodrich Co, Akron, Ohio.*

1 AIR RAID SIREN—Inside-the-plant air raid sirens made in two models, one for small departments, offices, laboratories, stock rooms, etc, and the other a large one for the manufacturing area, which can be heard over usual machinery din. Can be mounted either horizontally or vertically. *Breuer Electric Co, 5100 Ravenswood Ave, Chicago, Ill.*

CORK COATING — Plastic cork coating stops dripping from condensation or sweating pipes, walls, ceilings, tanks, etc. "NoDrip" is spread ¼ in. thick over any metal, concrete, brick, plaster, tile, wood, composition, galvanized or painted surfaces. Can be painted any color. Product is non-inflammable when wet and will not propagate fire when dry. *J W Mortell Co, Kankakee, Ill.*

ANGLE METER—Wolfe angle meter is practical slide-rule-type device for laying out angles directly on pipe or sheet metal. Using a method of measuring in both directions from a center line, it requires only four measurements to mark a pipe or stretch out in 16 different points on the circumference. *Interstate Sales Co, 1123 Broadway, New York, N. Y.*

SPRAY NOZZLE—Alfco-spray noozle said to meet demands for a variable all-spray nozzle, without a straight stream. From shutoff a slight turn of the tip produces 40-deg cone spray. Further slight rotation produces increasing cones up to full curtain of 150 deg with reversal to shutoff without intervening straight stream. *American-LaFrance-Foamite Corp, Elmira, N. Y.*

EXTINGUISHING POWDER — Whippet is claimed to be effective against all fires, such as gasoline, benzine, naphtha, tar, grease, etc. No equipment required, and powder said to be non-poisonous and to contain no noxious gases. *Halco Chemical Corp, 551 Fifth Ave, New York, N. Y.*

2 CLEANING MACHINE—L & R cleaning equipment is for regular cleaning of delicate instrument parts. Disassembled parts of instrument are placed in work basket and loaded basket is snapped into position on motor shaft. Basket is lowered in to solution, rotated, then sent to rinsing solution and dryer. *L & R Mfg Co, 54-56 Clinton St, Newark, N. J.*

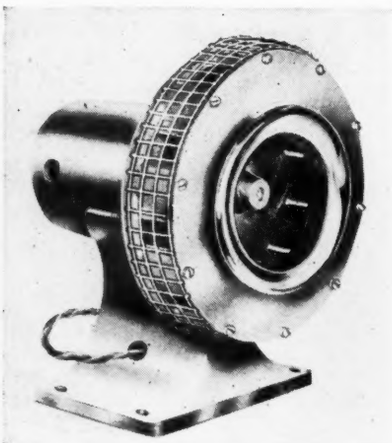
SAFETY CLOTH—CECO safety cloth is strong 10-mesh cotton cloth with rough, transparent plastic film. Cloth as designed especially for providing either a permanent or emergency "flexible" window for buildings of any kind, without use of priority metals and materials, and to be used as a protection on the inside of glass windows to reduce danger to persons and property should window be shattered. *Colloid Equipment Co, 50 Church St, New York, N. Y.*

SEALS—Stoffel seals consist of two component parts: preshaped metal seal-cup and individualized identification disk, printed in color. Seal can be permanently applied with string, thin cord or wire. Once two component parts are locked, seal cannot be tampered with without visual detection. Seals can be used to detect unauthorized use of extinguishers, etc. *Stoffel Seals Co, 188 Water St, New York, N. Y.*

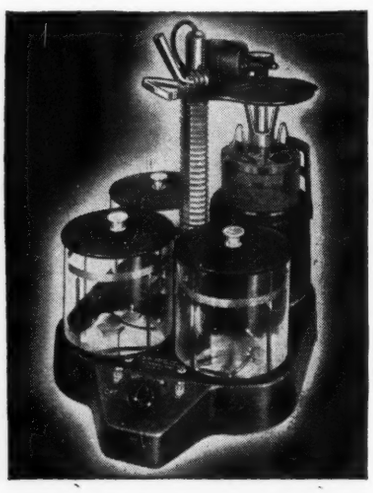
TEMPILSTICKS—Tempilsticks are used for signaling desired preheating temperatures in the welding of steel, cast iron, and non-ferrous metals. Tempilsticks have sharp, rapid melting action at stated temperatures. Example: A Tempilstick drawn across a heated surface leaves a chalk-like mark at temperatures below 300 F, which will melt into a liquid streak when surface reaches 300 F. Company also makes Tempil Pellets, used for similar purposes. *The Tempil Corp, 132 W 22nd St, New York, N. Y.*

3 AIR RAID SIREN—Air raid siren is audible for miles, according to manufacturer, and has rising sound pitch that reaches its maximum tone in from three to five seconds. Has sharp sound cutoff, making it useful for signaling. Unit operates on steam or air at 50 to 250 lb, 425 F. Unit is constructed of all bronze or steel and bronze. *Foster Engineering Co, 109 Monroe St, Newark, N. J.*

1



2



3

TUBING—Fibronized Koroseal tubing designed to be used as electrical insulation by manufacturers in the electronic, instruments, aircraft, electrical appliances and power industries. Insulation was developed by company's Fibron Div, from Koroseal. *Irvington Varnish & Insulator Co, Irvington, N. J.*

LEAK SEALER—Colorless leak sealer offers quick way to stop leaks in concrete walls, tunnels, floors, tanks, and pits. Procedure is to mix liquid chemical with ordinary portland cement, mold into a "carrot" and force into opening. Where dampness or seepage exists, apply plaster coat of same material to make surface dry. *Flexrock Co, 23rd & Manning, Philadelphia, Pa.*

MIXING CHAMBER — "Evertite" chamber is for easy installation on modern pressure oil storage tanks. Its purpose is to provide a simple, yet effective method of applying blanket of fire-smothering foam to burning oil surfaces. Has an inspection cap that can be removed, and a sealing diaphragm inspected, without releasing tank pressure. *American-LaFrance-Foamite Corp, Elmira, N. Y.*

SLOT INSULATIONS — Irv-O-Slot insulation consists of Fish or Spauldo papers coated with resin, or bonded by means of plastic insulator to cambric, silk or Fiberglas. Available in sheets and also tape form ready to be cut. *Irvington Varnish & Insulator Co, Irvington, N. J.*

4 BLACKOUT BULB—Bulb is lined inside with a pure silver reflector lining that hides all filament glare and projects light downward. Light leaks prevented by black silicate coating that covers bulb up to extreme lighting end, which is a deep blue. Bulb consumes 25 watts. *Wabash Appliance Corp, 335 Carrol St, Brooklyn, N. Y.*

SYNTHETIC SPONGE — Ameripol sponge is made from Ameripol, oil and heat-resisting synthetic rubber developed and perfected by company. Ameripol sponge available in black and in medium density only. Sponge in slab form comes in minimum size of 20x20 in. and maximum size 20x120 in., in thicknesses from 3/16 in. to ¾ in. *B F Goodrich Co, Akron, Ohio.*

SEALING COMPOUND — Duxseal, nonhardening adhesive sealing and caulking compound is used like putty and sticks readily to any clean surface without slumping, flowing or hardening in service, maker states. It is insoluble in water, unaffected by ordinary gases and condensates, and will not hurt hands. *Johns-Manville, 22 E 40th St, New York, N. Y.*

RESURFACER — Stonhard Stonpach develops strength so rapidly that it can be used where time is an important element, where closing of any area to traffic for more than a few hours is undesirable. Produces a sturdy floor, one that is smooth, skid-proof and easy to clean, capable of withstanding heavy traffic. No special equipment needed for its use. *Stonhard Co, 410 North Broad St, Philadelphia, Pa.*

BLACKOUT GLUE—No. 222 blackout glue can be applied with a brush or sprayed, and gives permanent waterproof bond. Blackout procedure is best accomplished by first painting with a black paint, then applying glue to window pane and sticking waterproof paper, cardboard or some other such material. *Midland Glue Product Co, 1488 Madison Ave, Detroit, Mich.*

5 PROCESSING MACHINE — Detrex processing machine is designed for cleaning and treating metal parts. Incorporates hot alkali wash, hot-water rinse, hot chromic-acid dip, hot-water rinse and oven dry off. *Detroit Rex Products, 13005 Hillview Ave, Detroit, Mich.*

FLOODLIGHT — Reflecting surface from floodlight is shatterproof, as reflector is coated with electrolytically deposited metal, which together with over-all backing of porcelain enamel, will keep glass from shattering. *General Electric Co, Schenectady, N. Y.*

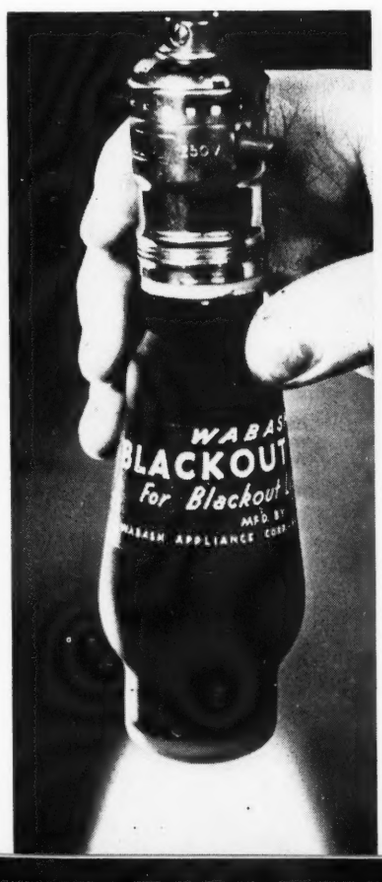
SPRAY ATTACHMENT — "Thumb-spray" nozzle attachment is for converting present extinguisher equipment. Clamps over the ⅜-in. hose and nozzle of any standard soda-acid, foam, gas-cartridge or pump-tank fire extinguisher. Unit is permanent attachment made of spring steel with a deflector edge which influences range and distribution of spray. *Pyrene Mfg Co, Newark, N. J.*

FLASHING METHOD—Flexrock Flashing method takes place of lead or copper. Maker says that inexpensive application makes a permanent replacement and adheres tightly to all types of industrial roofs, including corrugated iron. Quick brush application can be made over entire roof with good results. *Flexrock Co, 23rd & Manning, Philadelphia, Pa.*

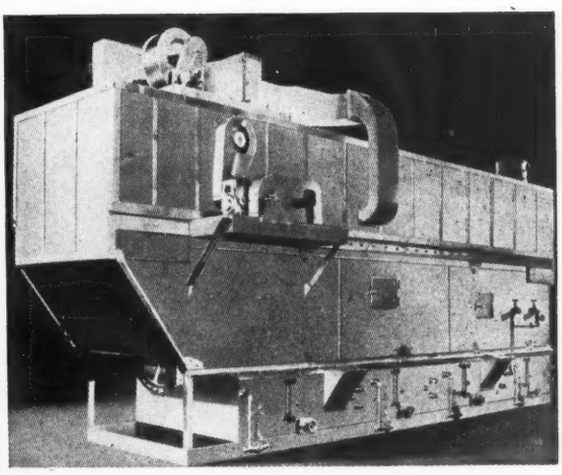
BOMB SHOVEL—Shovel carries a load of sand in handle to smother incendiary bombs. Made of galvanized sheet metal and weighs only 17 lb when loaded. Sand is automatically released from handle after operator has used hollow side of shovel to smother blazing bomb. *Industrial Maintenance Engrg Co, Ltd, 724 S Spring St, Los Angeles, Calif.*

6 STEEL FLOODLIGHT — Steel L-68 floodlight offers a choice of three reflectors: (1) chromium plated for narrow beams, (2) painted steel for wider beams, or (3) internal silvered glass. Accomodates 750-, 1000-, or 1500-watt general-service lamp. *General Electric Co, Schenectady, N. Y.*

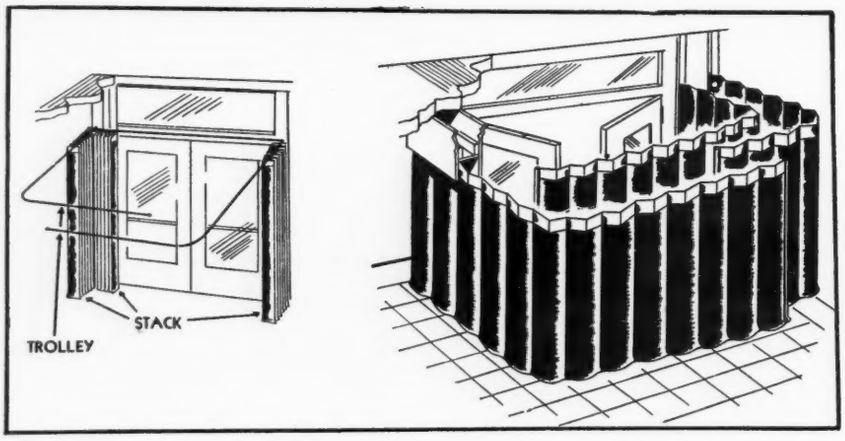
4



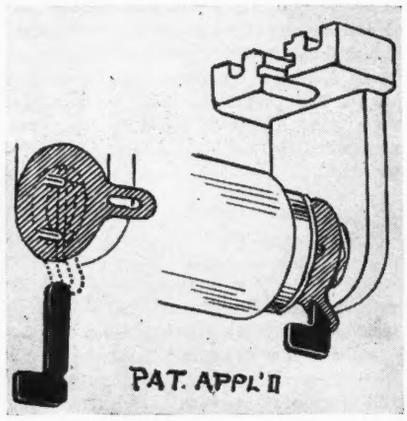
5



6



1



2

MX GRANULES—MX granules are for extinguishing magnesium fires. Manufacturer claims that control of magnesium fires with MX granules is simple and effective. Tests are said to show that, when spread over the fire, these granules soften and seal the burning magnesium with an airtight blanket, cutting off oxygen and quickly extinguishing the fire. Same principle applies, according to the maker, to magnesium incendiary bombs. *Philip Carey Mfg Co, Lockland, Ohio.*

BLACKOUT BULB—Blackout bulb can be kept burning for emergency lighting without the need for window shades or blinds, and has been approved by the War Department. Bulb gives faint glow of orange light sufficient to distinguish objects in a room, but not enough to be visible from the air even though placed directly in line with an open window. *Lamp Div, Westinghouse Electric & Mfg Co, Bloomfield, N. J.*

OIL-LEVEL RELAY—Relay intended for use with gravity-feed-type reservoir on oil-filled cable. Alarm switch indirectly controlled by a hollow steel ball which fits inside the walls of a cylinder-shaped chamber enclosed in a non-magnetic housing. At its lowest point the ball actuates a magnet which pulls down a hinged arm, causing alarm switch to close. Excess oil raises ball to chamber top, where a second tripping switch is located. *General Electric Co, Schenectady, N. Y.*

GREASE SOLVENT—Gunk X-11 available as a concentrate, which may be diluted with a grease solvent before being used to charge large open cleaning tanks or vats. New cleaning method is carried out by cold immersion of greasy or dirty parts. The new solvent, it is said, not only takes out the cling from hard mineral dirt and grease accretion, but emulsifies them so that they may be rinsed away by sluicing with water. *The Curran Corp, Malden, Mass.*

FLOOR RESURFACER—Resurfacer can be installed without interruption to floor traffic, and can be used immediately. It is a ready-mixed plastic material that is rolled or tamped into a hard surface. Product bonds to oily floors, and is highly resistant to oils and other destructive materials. Can be applied directly to concrete, steel, stone, wood or brick floors, walks, etc. *Flush-Stone Co, Inc, Philadelphia, Pa.*

SABOTAGE PROTECTION—To take the place of costly, short-lived sandbag barricades for sabotage protection around power transformers, substations and other vulnerable public utility and industrial equipment, company has devised economical wall of lightweight concrete blocks filled with sand. Blocks are made with Celocrete lightweight aggregate, an expanded blast-furnace slag. The block wall costs from one-half to two-thirds less than sandbag barricade. *The Celotex Corp, 919 N Michigan Ave, Chicago, Ill.*

SPECTRUM CHART—Wall-size chart shows every part of the electromagnetic spectrum of practical significance, which is analyzed in detail. Emphasis placed on uses of each kind of radiation. Spectral terms are carefully and simply defined in a special glossary. *Westinghouse Electric & Mfg Co, East Pittsburgh, Pa.*

FLOOR RESURFACER—"Instant-Use" resurfacer can be applied to worn floors and used immediately. Said to improve in smoothness and become more compact under constant traffic. Adheres to old concrete or wood, and bonds to a feather edge. *Flexrock Co, 23rd & Manning Sts, Philadelphia, Pa.*

CORROSION INHIBITOR—Inhibitor is the ferric salt of quachrom glucosate and introduces a non-oxidizing chromium inhibitor for the first time. Identified as ferri chrom glucosate, it controls corrosion in some applications in concentrations as low as two parts per million and may be employed to reduce equilibria and at low pH values for corrosion control. *D W Haering & Co, Inc, 205 West Wacker Drive, Chicago, Ill.*

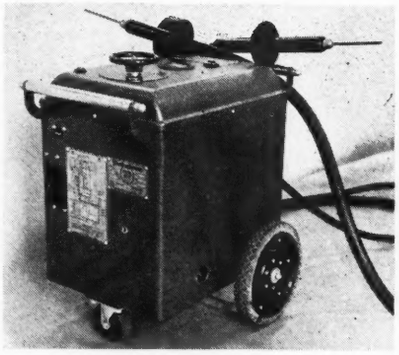
BOMB EXTINGUISHER—"Bomb-Quench" powder softens in the heat, flows over the burning mass, clings to it, forms a completely airtight cover that stops combustion quickly, and creates an extinguishing chemical vapor within the insulated crust formed over burning molten metal. Although this chemical forms a solid supporting crust which can be removed from the surface, it is still soft enough to be broken up if desired. *O H Adams Co, 2018 East Thomas Ave, Milwaukee, Wis.*

ANTI-FREEZE—"No-Freeze" is permanent-type anti-freeze which, according to the manufacturer, contains no critical materials and is therefore available in unlimited quantities. Manufacturer guarantees product against freezing down to 35 F below zero; to prevent rust of any part of the cooling system; not to boil off or evaporate (boiling point 324 F), and never to require testing for strength. *Great Northern Chemical Co, Oak Park, Ill.*

INSULATING VARNISH — Thermoset is synthetic-resin insulating varnish cured by heat-induced chemical polymerization. It sets to an infusable flexible insert film of clear amber color and has high dielectric and bonding strength. Of low viscosity, varnish will not skin over or gum up equipment with an insoluble film, and penetrates the deepest windings to fill interior voids completely. Said to be not affected by acids or alkalies in ordinary concentrations. *Westinghouse Electric & Mfg Co, East Pittsburgh, Pa.*

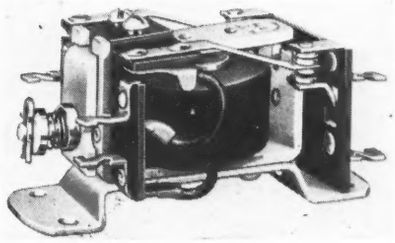
EXTINGUISHING CHEMICAL—"Cend-Ex" is a granulated coal-tar pitch conforming to the standards set by the U S Bureau of Mines for use in extinguishing magnesium bombs and fires. It comes packed in 12½-lb rectangular tubes which can be hung on wall or placed at strategic points in a factory, ready for instant use. The tube is 30 in. long, enabling operator to work well away from bomb or fire. *S Obermayer Co, 2563 West 18th St, Chicago, Ill.*

SAFETY SOLVENT—Hand-wiping safety solvent is to be marketed as a safety replacement for naphtha, gasoline and kerosene. Although designed for removing cosmoline from rifles, solvent is also applicable to wide industrial use as a naphtha substitute for grease-cleaning and hand-wiping operations. In spite of its high solvency against mineral oil or dirt, solvent does not de-oil the skin, has no toxic vapors. *The Curran Corp, Malden, Mass.*



3

4



5

1 BLACKOUT PARTITION — Blackout partition works on accordion principle, assuring unusual flexibility. Partition derives its accordion-like operation from specially-designed hinge lock, self-spacing hinge plate at the top. Folding on itself, it has a roller assembly traveling easily on an overhead track. Illustration shows arrangement of trolley and track, and also a typical application on a double door. *New Castle Products, New Castle, Ind.*

MOTORS, SWITCHES, OTHER ELECTRICAL EQUIPMENT

2 LAMP LOCK—Flur-O-Lock is device for locking fluorescent lamps against vibration to prevent premature lamp failure, loosened lamps, guard against accident hazard, and eliminate costly lamp replacements. To install, place one lock on the contact prongs at each end of the lamp. Set lamp in socket. Insert keys in socket slot and see that notch in key is engaged in hole in cam of block. This holds lamp in locked position (see illustration). *Laduby Co, New Haven, Conn.*

3 INSULATION TEST SET—Unit designed for testing insulation of diesel-electric locomotives and other electric equipment. Available in ½- and 2-kva ratings, set includes a high-voltage transformer, a means of regulating the test voltage, and the necessary overload and undercurrent devices for protection. Voltage supply is received at the set through a breaker with thermal elements for protecting it from overload. *Westinghouse Electric & Mfg Co, East Pittsburgh, Pa.*

4 PHOTOELECTRIC SYSTEM—Type A28L control is for outdoor and indoor use over very long ranges. Light source projects a practically invisible light beam for distances of 350 to 700 ft, and it is possible to surround power plants, factories, and other vital areas completely. If the light beam is broken, photoelectric control contacts close, sounding alarms, operating a central station system, turning on floodlights, etc. *Photoswitch, Inc, 21 Chestnut St, Cambridge, Mass.*

5 RELAYS—Ward Leonard Bulletin 104 Relays available for operation on ac and dc circuits. Standard relays are of open type, front-connected solder-type terminals, double-pole, double-throw, silver-to-silver contacts. Vibration resistant up to ten times gravity in energized position. *Ward Leonard Electric Co, Mt Vernon, N. Y.*

METER PROTECTOR — For preventing damage by lightning surge voltages, new indoor watthour meter protector is announced. Known as Type A, unit has line to ground rating cutoff of 500 volts, a 60-cycle gap breakdown of 800 to 1200 volts rms, and a discharge capacity of 20,000 amp crest. Circuit voltage range is from 110 to 575 volts on 3-phase circuits. *Westinghouse Electric & Mfg Co, East Pittsburgh, Pa.*

MERCURY RELAY—H-B mercury plunger relay has been completely redesigned and improved to insure long life, even under severe conditions of vibration and shock, according to the manufacturer. Units are rated at 30 amp, 110 volts, 1 hp, available for either ac or dc. *H-B Electric Co, 2530 N Broad St, Philadelphia, Pa.*

BALANCING UNIT — Portable dynamic balancing unit designed to reduce harmful vibration and undesirable noise in rotating machines assembled by mass production methods. Known as Type HQ, balancing unit consists of a sensitive wattmeter assembly, a sine-wave generator, and a velocity vibration pickup, and necessary cords. Apparatus may be used over a speed range of from 600 to 10,000 rpm. *Westinghouse Electric & Mfg Co, East Pittsburgh, Pa.*

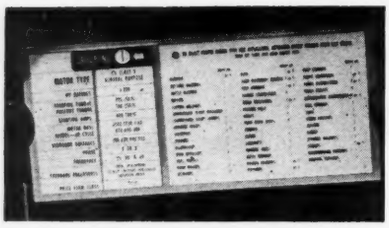
AUTOMATIC SYNCHRONIZER—Type XK automatic synchronizer provides practical and inexpensive device for automatically synchronizing small generators. Synchronizer is limited in use to ac machines having a kva rating of 250 or below, and a voltage rating of 600 or less, with a suitable governor and fast-closing machine contactor or breaker. Synchronizer is available for 50-, 60-cycle service. *Westinghouse Electric & Mfg Co, East Pittsburgh, Pa.*

POWER UNITS — Katolight units now available in 7½- and 10-kw sizes at 1200 and 1800 rpm, and in 15-kw sizes at 1800 rpm. Models available either self excited or with separator exciter attached. Units driven by 4-cylinder 4-cycle engines, water-cooled, with radiator fan and centrifugal pump, and including exhaust, muffler, governor with variable-speed control, pressure-lubrication system and other equipment. *Kato Engineering Co, Mankato, Minn.*

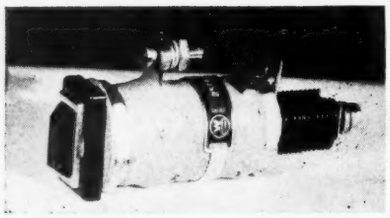
SAFETY TRANSFORMER — Acme safety transformer provides for two 32-volt ac extension lines to provide light for workmen who must perform duties under conditions in which explosive gases or vapors exist. Applies to cases were inflammable materials are stored or in process, and where possibility of a high-voltage spark may cause considerable damage. Mounted in one end of the unit are dual polarized secondary receptacles for two 32-volt ac extension lines, a plug-in for inspection light. *Acme Electric & Mfg Co of Cuba, New York, N. Y.*

FLUORESCENT LAMP PROCESS—Process said to increase life and initial brilliance of fluorescent lamps and eliminate subsequent development of dark splotches or shadowy end-bands. Basis of new process is explosion of a mercury "bomb" in lamp interior during manufacture, regulating exactly amount of mercury in lamp and producing improved performance claimed. Just before lamp is finally sealed, enough heat is applied to explode the tubing and mercury is released as a vapor in the argon-filled interior. *Sylvania Electric Products Corp, Salem, Mass.*

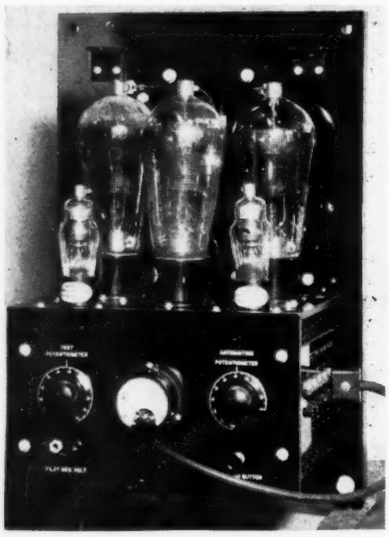
FLUORESCENT LAMP BALLAST — Four-lamp ballast for fluorescent lighting requires 48% less copper, 47% less iron and steel, and 50% less aluminum than the two previous 100-watt two-lamp ballasts. New ballast will operate four 100-watt lamps, but costs no more than the 2-lamp 100-watt ballast. Unit operates over a line voltage range of 250-28 volts. *General Electric Co, Schenectady, N. Y.*



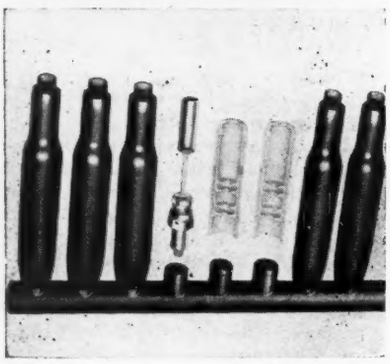
1



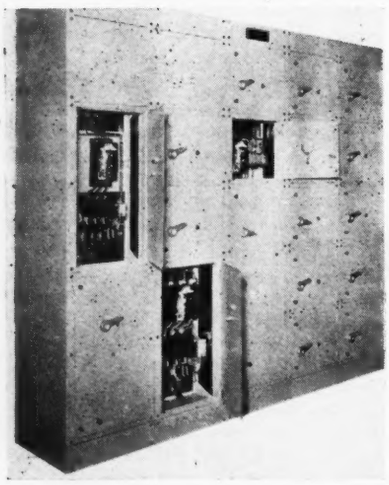
2



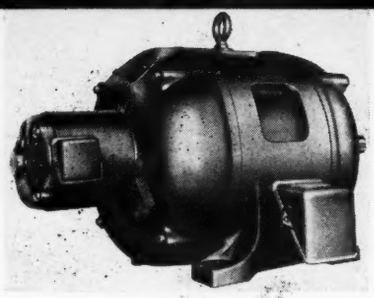
3



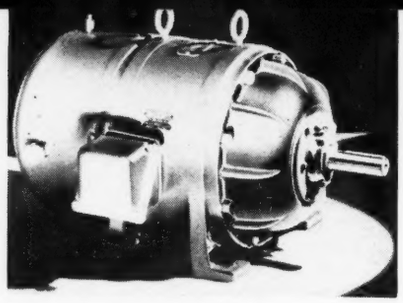
4



5



6



7

1 MOTOR SELECTOR — Pocket size "Slide-Rule" selector for electricians, plant maintenance men and others interested in selection of electric drive equipment announced. Table lists various uses and indicates which of four principal types of ac motors should be selected. Specifications, performance ratings and control classes for the required type readily determined by making corresponding setting on slide. Information is obtained from selector by setting cardboard slide for the proper motor type and reading its specifications through the window. *Westinghouse Electric & Mfg Co, East Pittsburgh, Pa.*

2 IND.CATING LAMP — Designed for general indicating or signal purposes on switchboards, control desks and panel board, new indicating lamp has rectangular shaped lens designed for extreme angular visibility. Receptacle is made of one-piece molded material and is suitable for mounting on panels from 1/16 to 2 in. thick. *Westinghouse Electric & Mfg Co, East Pittsburgh, Pa.*

3 VOLTAGE REGULATOR — DT-5 electronic voltage regulator is sensitive device which regulates output voltage of ac and dc generators, providing output voltage is more than 46 volts. Unit operates from a 3-phase ac power supply and acts as a grid-controlled rectifier to supply dc field current to the generator, or the exciter of the generator being regulated. An anti-hunt circuit is built into the regulator, preventing the regulator from overshooting when close regulations is required. *Westinghouse Electric & Mfg Co, East Pittsburgh, Pa.*

4 NETWORK CONNECTOR — Insulated connector for use in junction or limiter boxes of industrial secondary networks. The connector, a special Burndy Mole equipped with Molimiters, provides a simple and compact means of interconnecting the ties of the network, joining the ties to the network transformers, and tapping off any number of loads. To isolate faulty ties, each outlet is provided with an easily installed fusible element (Molimiter) inclosed in an arc-proof chamber. *Burndy Engrg Co, 107 Eastern Blvd, New York, N. Y.*

5 MOTOR CONTROL CENTER—Unit for group control of ac motors up to 100 hp. For operation on 3-phase 220-, 440- and 550-volt circuits, motor-starter unit consists of a full-voltage magnetic starter providing external manual reset, thermal overload, and low-voltage protection. Entire control center is finished and assembled ready to receive line, motor and control connections. *Westinghouse Electric & Mfg Co, East Pittsburgh, Pa.*

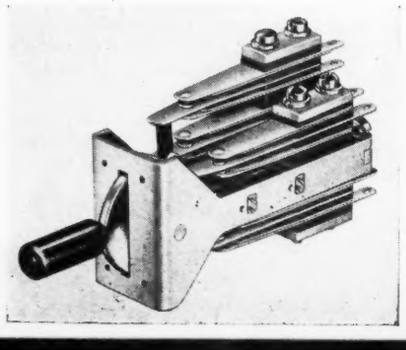
6 GENERATORS—Company offers streamlined, revolving-field, ac generators in sizes from 7½ to 75 kva, 4, 6 or 8 pole, 1800, 1200 or 900 rpm, 60 cycle, for belt or coupling drive, or flange mounting. For continuous duty in isolated plants or to supplement other available power supply. Can be designed for any desired power factor, but regulation will be governed by the power factor. *Century Electric Co, 1806 Pine St, St. Louis, Mo.*

7 INDUCTION MOTORS—New line of polyphase induction motors, in sizes from 1 to 20 hp, NEMA frames 203 to 326, inclusive, suitable for use under hazardous magnesium-dust conditions. Motors totally inclosed with non-ventilated construction in smaller ratings, and fan-cooled construction above 2 hp. Simple cast-iron end shields, stator frames and fan housings make dust-tightness possible without complicating assembly. *General Electric Co, Schenectady, N. Y.*

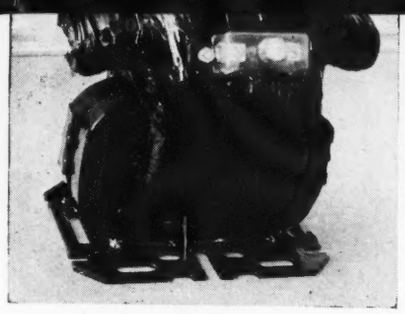
8 LEVER SWITCH—Series 4101 lever switch is heavy-duty, multiple-contact unit, said to be first such switch to provide positive action independent of contact springs successfully. Design affords great flexibility, according to the maker, of contact arrangements, with either locking or non-locking action. *Donald P Mossman, Inc, 6021 N Northwest Highway, Chicago, Ill.*

9 ELECTRIC MOTOR — "Cowl-Cooled" is newest fan-cooled motor developed by company. Motor is designed for dusty locations and for all applications where conventional totally inclosed motor has been recommended. Because ventilating air is blown over external ribs which run the length of the frame and is not forced

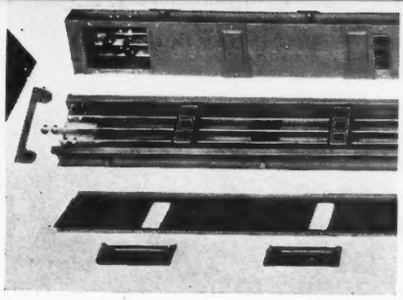
8



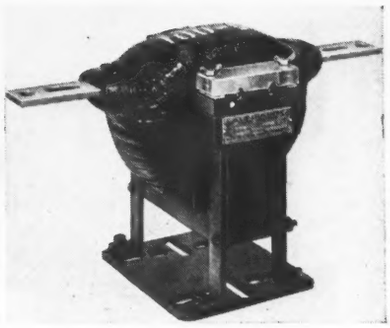
9



10



11



14

through internal passages, trouble-free operation is assured, even in atmospheres containing excessive amounts of destructive fumes, abrasive dust, oil or dirt, or other harmful conditions. *Crocker-Wheeler Electric Mfg Co, Ampere, N. J.*

10 INDOOR CURRENT TRANSFORMER —Type CT indoor current transformer has current rating of from 10 to 800 amp primary and 5 amp secondary; voltage ratings are 5, 8.7, and 15 kva. Definite primary terminal dimensions set for distance between centers of outside terminal holes, size of hole, size of slot, distance from base to under side of terminal and overall height from mounting base to transformer top. Therefore any standard type CT transformer is interchangeable with any other in its voltage class, regardless of its current rating. *Westinghouse Electric & Mfg Co, East Pittsburgh, Pa.*

11 BUS DUCT — Composed of copper busses, Prestite separator and a dust-tight metal inclosure, the unit is available in ratings of from 250 through 1400 amp. At currents below 1500 amp hot-rolled sheet steel is used; at values of 1500 amp or over, a feeder duct of different construction is available. Outlet receptacle covers are not removed, but simply slide along duct to expose plug-in connections. *Westinghouse Electric & Mfg Co, East Pittsburgh, Pa.*

12 CURRENT TRANSFORMER—Split-core current transformer now available for testing power circuits. Split-type transformer eliminates any necessity of opening circuit in question, whether or not it is carrying a load. Illustration, showing right-angle interleaved core construction, helps to explain why the separable core may be left open as much as ¼ in from "closed" position, without appreciably affecting instrument reading. Orders for these units must carry priority ratings. *R B Annis Co, 1101 N Delaware St, Indianapolis, Ind.*

13 TERMINAL CONNECTOR — Quiklug connector takes a wide range of conductor sizes, is compact and provided with serrations on cable clamping elements on all but very small sizes. Unit can accommodate as many as twelve different cable sizes. *Burndy Engrg Co, 107 Eastern Blvd, New York, N. Y.*

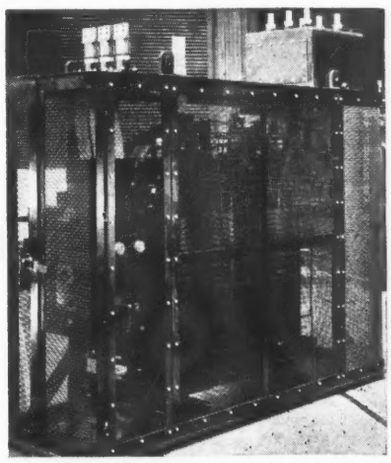
14 CURRENT TRANSFORMERS—Following adoption of standard primary ratings for current transformers by EEI and NEMA, the company developed three new types of current transformers. Conforming to the standard major dimensions in the three ratings—5 kv, 8.7 kv, and 15 kv—new transformers have standard base dimensions and primary bar heights and dimensions, making possible free interchange on all metering installations. *Allis-Chalmers Mfg Co, Milwaukee, Wis.*

15 MOTOR — "Safety-Circle" protected motor has wide solid rib integrally cast as part of motor, providing unbroken circle of protection around stator. One-piece cast frame and end shields guard motor from exterior knocks and abuses, while more liberal use of materials makes unit internally and electrically stronger because current and magnetic densities are less extreme. *Allis-Chalmers Mfg Co, Milwaukee, Wis.*

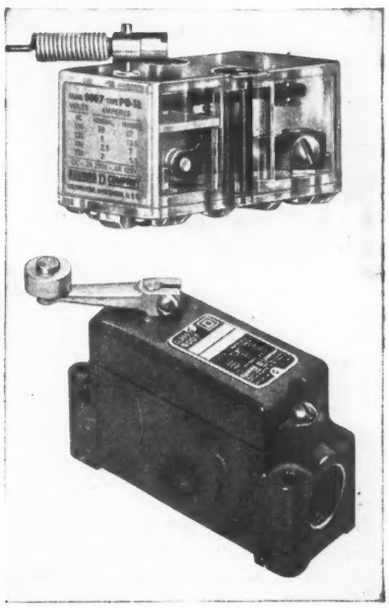
16 DISTRIBUTION UNIT—Consisting of a high-voltage, double-throw primary transfer switch, an air-cooled 3-phase transformer and network protector, distribution unit for secondary network system transforms power from the primary voltage to secondary grid voltage. Primary air-break switch opens the exciting current of the associated transformer and will withstand a short-circuited current of about 10,000 amp for two seconds without damage to or appreciable movement of its parts. *Westinghouse Electric & Mfg Co, East Pittsburgh, Pa.*

17 OIL-IMMERSED STARTERS — Starter line incorporates design features which facilitate installation, service and operation. Easier installation provided through use of a cast head with a wiring manifold which permits conduit entrance from five directions. A removable cover plate facilitates threading of bare wire through an insulating spacer above the oil bath. Two kinds or starters available —(1) Corrosion resisting and (2) explosion resisting for class I, group D hazardous locations. *Square D Co, Industrial Controller Div, 4041 N Richards, Milwaukee, Wis.*

15

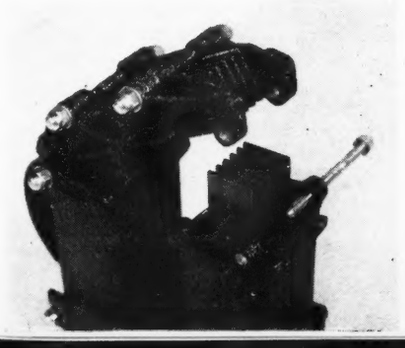


16

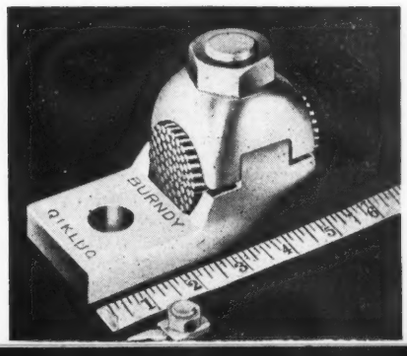


17

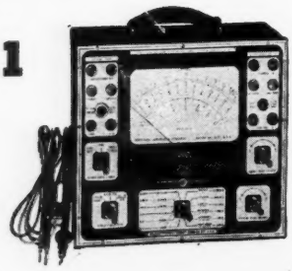
12

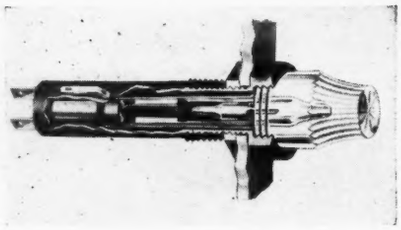


13



1





2

3

4

1 MULTI-RANGE TESTER—Series EV-10 is an electronic measuring instrument which provides full functions of eight individual instruments to satisfy most measurement requirements. Combining both VTVM as well as standard 1000 ohms per volt, ac-dc test circuits, instrument permits rapid, accurate measurement without materially disturbing performance of circuits under analysis. *Precision Apparatus Co, 4 Kent Ave, Brooklyn, N. Y.*

2 INDICATOR LIGHT — Littelfuse Indicator Light No. 1414, when installed in any convenient or desirable point in connection with a remote motor control, works instantly, with a plainly visible signal to show on or off. When the circuit breaker opens the light goes on. Can be obtained for 24- or 48-volt filament bulb, with which no resistor is used. Otherwise it uses a built-in 200,000-ohm protective resistor, in series with a small neon lamp. *Littelfuse, Inc, 4757 Ravenswood Ave, Chicago, Ill.*

3 SIGNAL LAMP—Helmet-like blackout caps are to shield the red glow of signal lamps on outdoor electric transformers. Signal lights contain only 5-watt lamps, and are not noticeable when bright street lights are on around them. But with blackout of cities against air raids, these tiny lights glow brightly. Caps snap on over the red lights, which flash on when transformers are in danger of becoming overheated. A small hole in one side of the cap lets a narrow beam of light shine downward to guide service men, but no light can be seen from above. *Westinghouse Electric & Mfg Co, East Pittsburgh, Pa.*

4 MOTOR CONTROL—Thy-Mo-Trol electronic motor control provides simple stepless control of dc motors from ac lines wherever wide speed range is desired. Normally consisting of three separate units, small control station, transformers and thyratron tube panel, control is said to be first to provide complete equipment for electrically starting, stopping, accelerating and regulating motor speeds. *General Electric Co, Schenectady, N. Y.*

5 FUSE CUTOUT—Primary fuse cutout is for use on ac circuits up to 12,500 volts, where fuse requirements do not exceed 50 amp. All contacts are silver coated to assure low contact drop and fuse tube is made of moisture-resisting fibre-lined duck Micarta. Toggle mechanism provides a drop-out action of door to indicate blown fuse. *Westinghouse Electric & Mfg Co, East Pittsburgh, Pa.*

6 VOLTAGE REGULATOR — Voltage regulator designed especially for feeder circuits where exacting voltage regulation requirements must be met and liquid cooling is undesirable. Known as Type SA, regulator is intended for single-phase feeders, 2400 volts, 50 to 300 amp, and 4800 volts, 25 to 150 amp. For low maintenance and continuity of service, a new design of voltage regulating relay eliminates use of assembly of delicate pivots, pins and springs. *Westinghouse Electric & Mfg Co, East Pittsburgh, Pa.*

7 CONNECTOR — Burndy connector, Type NVT, is all-clamp T-connector for tapping cable from tubing. Flattened U-bolt on tap accommodates large range of cable sizes. Large comprehensive range of U-bolts makes it suitable for clamping flexible and extra-flexible cables. *Burndy Engineering Co, 107 Eastern Blvd, New York, N. Y.*

8 TESTING SET—Improved 35,000-volt oil and insulation testing set which can be converted for high-potential tests on a variety of materials and products announced. Set consists of a 2-kva, 35,000-volt liquid-immersed testing transformer; an air-cooled variable voltage oil tank; an air circuit breaker for opening the circuit after the test is completed; an oil-testing receptacle; a pushbutton station, and a double-range voltmeter for accurate indication of insulation breakdown voltage. *General Electric Co, Schenectady, N. Y.*

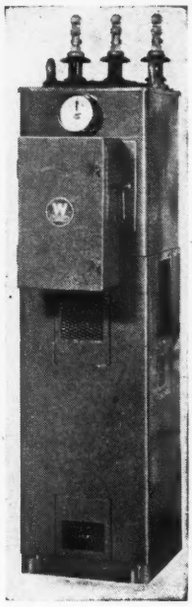
TRANSFORMER COOLING SYSTEM — Electro-Cooler unit said to step up transformer capacity already in service by about 20 to 40%. Forced-oil system of cooling transformers is made highly practical with the Electro-Cooler, because unit is compact, factory-assembled and factory-tested at high pressure to minimize future maintenance. Unit consists of radiator-type cooler and special pump with motor inclosed. These are connected by piping to standard radiator valves at the side of the transformer. *Allis-Chalmers Mfg Co, Milwaukee, Wis.*

SWITCHGEAR CASES — 250-volt dc air circuit breaker switchgear equipments for heavy duty available now in metal-inclosed cases. Latest development gives new safety features to the well-known MC-5 breaker, formerly available only in "live-front" construction. Individual air circuit breakers are inclosed in separate steel compartments, as are control devices of the contactor. *General Electric Co, Schenectady, N. Y.*

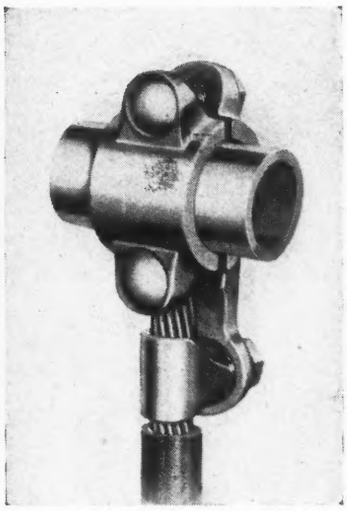
LAMP STARTER—New line of fluorescent lamp starters designed to protect ballast and starter, and to eliminate flashing of failed lamps. Automatically opening the circuit when a lamp fails, these units are especially suitable for installations that make immediate replacement of a burned-out lamp impractical. Unit not only protects itself, but prevents abuse of the ballast, effects a substantial saving of power and also does away with the usual flashing of burned-out lamps. *Sylvania Electric Products Corp, Salem, Mass.*

LIMIT SWITCH—Type P small precision limit switches have been designed specifically as built-in contact mechanisms on electrical devices. Basic switch units are inclosed in transparent molded polystyrene cases, sealed against tampering, yet allowing visual inspection of contacts. Normally open and closed circuits are insulated electrically to make unnecessary

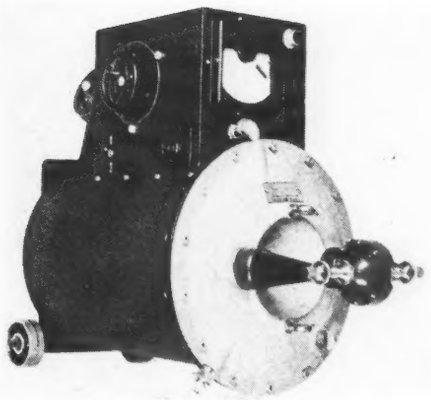
5



6



7



8

a common connection between them. *Square D Co, Industrial Controller Div, 4041 North Richards St, Milwaukee, Wis.*

UNIT SUBSTATIONS — Standardized load-center unit substations available in sizes ranging from 100 to 2000 kva. Substation consists of a metal-inclosed incoming line section, throat-connected transformer, and low-voltage feeder section. Standard load-center unit substations are available for either indoor or outdoor service. *Allis-Chalmers Mfg Co, Milwaukee, Wis.*

EXPLOSION-PROOF TIMERS — Explosion-proof timer is suitable for operation in atmosphere containing gasoline, naphtha, petroleum, benzol, aceton, lacquer, solvent, natural gas, and other explosive mixtures, etc. Time-delay relay is laid out for panelboard mounting with the setting knob and dial projecting. *The R W Cramer Co, Inc, Centerbrook, Conn.*

SECTIONAL RESISTOR — For measuring any high-voltage ac or dc circuit of 250 to 30,000 volts, sectional resistor is designed to replace in certain cases old box-type resistor which had a high power consumption and was inconvenient to install or replace. Made up of individual, hermetically sealed units wire wound around a ceramic resistor spool. Resistor units have values of from 0.25 to one megohm and a rated current of one milliampere. *Westinghouse Electric & Mfg Co, East Pittsburgh, Pa.*

LOW-TEMPERATURE LAMP — Hygrade fluorescent lamp for low-temperature operation. Because standard fluorescent lamps do not operate efficiently at temperatures lower than 50 F, these lamps will fill a definite, though limited need. Hygrade LT lamp is designed to start and operate satisfactorily at temperatures as low as zero F, when used in conjunction with the company's Mirastat No. 4. Because of limited application, lamp will be supplied only in 40 watts, white. *Sylvania Electric Products Corp, Salem, Mass.*

OSCILLOSCOPE — Peak-reading portable instrument has been developed primarily for use in resistance welding, but may be applied to supplement other instruments used in troubleshooting. Unit has high-speed response to both current and voltage made possible by use of permanent magnet oscillograph galvanometer. Magnitude, symmetry and uniformity of current are revealed by length, position and uniformity of a horizontal trace of light on ground glass screen. *General Electric Co, Schenectady, N. Y.*

INDUSTRIAL LIGHT—Because of its elliptical shape, the fixture provides a wide lateral distribution of light. Elipso Standlite available in two styles, direct, which delivers light laterally, and angle, which provides a slight forward throw. *Goodrich Electric Co, 4600 Belle Plaine Ave, Chicago, Ill.*

TERMINAL BLOCKS—Terminal blocks now supplied in kit form or sets of parts unassembled. Kit contains 50 center barriers and terminals. These terminal blocks are easy to assemble. *Curtis Development & Mfg Co, 1 N Crawford Ave, Chicago, Ill.*

TRI-CLAD MOTORS—Three new motors, a vertical general-purpose polyphase, a vertical shielded polyphase, and a vertical shielded single-phase motor have been added to Tri-clad line. All frame sizes have common mounting dimensions, making possible interchangeability of many horsepower and speed combinations, including single-phase ratings. Motors are suitable for outdoor operations, except where extremes of moistures, dust or other harmful agents make selection of fan-cooled motors more economical. *General Electric Co, Schenectady, N. Y.*

SEPARATOR—Type "R" magnetic separator now has modern appearance in so far as structural frame design is concerned. Elimination of much of heavy framework which formerly supported the coils has been accomplished without any weakening in the unit structure. Separator employs cross-belt method of magnetic separation, material being fed by a special feeding device on the main belt, and magnetic portions being intercepted and carried to special chutes on the side. *Stearns Mfg Co, Aurora, Ill.*

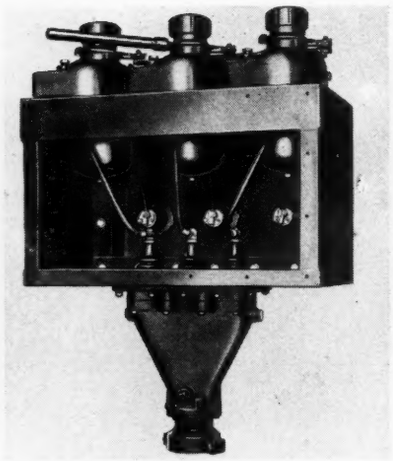
REVERSING STARTERS—New line of alternating-current combination magnetic reversing starters for full-voltage and reversing of squirrel-cage induction motors announced. Units also suitable for primary control of wound-rotor motors, and consist of two mechanically interlocked reversing contactors, a 2-pole overload relay, and either a circuit breaker or a fusible or non-fusible motor-circuit switch. *General Electric Co, Schenectady, N. Y.*

SYNCHROMATIC RELAY — Synchromatic relay for field application makes possible more satisfactory synchronous motor starting, according to the company. Relay consists of two elements, one speed responsive and the other time responsive. Speed-responsive element is a current relay and the time-responsive element is a rotary drum switch. *Westinghouse Electric & Mfg Co, East Pittsburgh, Pa.*

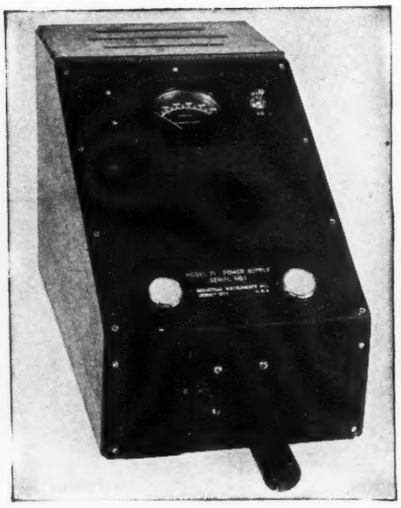
PORTABLE SERVICE LIGHT — Adjustable from 30 in to 7 ft, and designed to project light into many inaccessible places, new portable fluorescent service light has been adopted by industrial plants for miscellaneous use. Unit is adjustable up or down, horizontally or vertically, or in any angle of 180-deg arc, without the use of tools. *Lumidor Mfg Co, Los Angeles, Calif.*

FLUORESCENT UNIT—Mitchell fluorescent unit comes in two models—Model No 2034 using two 40-watt bulbs, and Model 2035, using three 40-watt bulbs. Both are high-intensity, high-efficiency units with a 13½-deg cutoff which eliminates glare from all normal viewing angles. Units are corrected for power factor and have latest approved ballasts and starters. *Mitchell Mfg Co, 2525 Clybourn Ave, Chicago, Ill.*

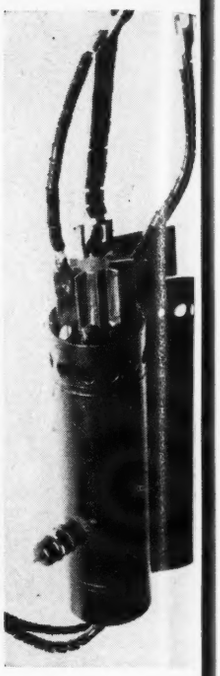
1



2



3



4

1 SEQUENCE TIMER — Weld and sequence timer is for automatic spot, butt or projection welding. Timing circuit is fully electronic and consists of a resistor capacitor circuit whose charging rate is adjustable by varying a resistor. The circuit voltage is applied to the grid of a thyratron tube so that after a predetermined charging time has elapsed the thyratron is energized and operates the relay. *Westinghouse Electric & Mfg Co, East Pittsburgh, Pa.*

2 OIL FUSE CUTOUTS—Metal-inclosed gang-operated oil fuse cutouts are for short-circuit protection and switching. New assemblies permit totally metal-inclosed installations, either single- or three-phase. New assemblies are particularly well adapted for use in industrial plants for branch circuits, individual transformers or banks, motors, control apparatus, electric heating and other specialized equipment. *General Electric Co, Schenectady, N. Y.*

3 VOLTAGE BREAKDOWN TESTER — Instrument consists essentially of a stepup transformer accurately controlled by a variac current-limiting resistors safeguarding equipment in the event of a dead short; a relay indicator by means of panel light when there is a breakdown; a meter providing direct-reading voltages, and the rectifier and filter circuit providing high-voltage dc current for use when testing. *Industrial Instruments, Inc, 156 Culver Ave, Jersey City, N. J.*

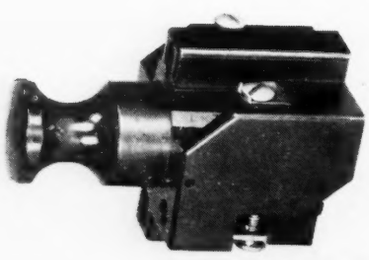
4 INDUSTRIAL TUBE—GL-414 is an all-metal negative-grid tube for general-purpose industrial applications. Because it has a shield grid it is suitable for control circuits where available grid power is very small, and where it is desirable to actuate the grid from a high-impedance source. Typical applications include use on motor controls, power rectifiers and voltage regulators. *General Electric Co, Schenectady, N. Y.*

5 STATIONS — Safety pull-push button stations for motor control of automatic machines utilize both push and pull of button to perform function. Normal position of button is in center; button is pushed to stop the motor being controlled, while it is pulled to start motor or machine. *Arrow-Hart & Hegeman Electric Co, Hartford, Conn.*

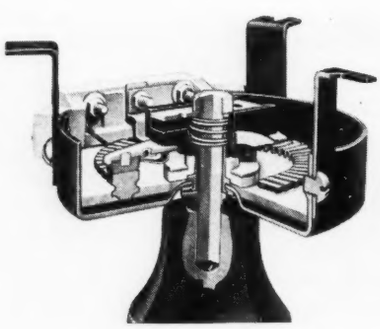
6 RHEOSTATS — Bulletin 60 pressed-steel rheostats meet need for small sturdy power rheostat having a large number of steps and ample current-carrying capacity. Units are 4 in. in diameter, with as many as 43 steps of control, and are rated for 100 watts. Spacings through air and creepage distances between parts of opposite polarity and between current-carrying and grounded parts meet AIEE, NEMA and UL requirements for 300-volt service. *Ward Leonard Electric Co, Mt Vernon, N. Y.*

7 OIL SWITCH — Novalux controller said to assure increased protection against electrical breakdown on high-voltage circuits. This solenoid-operated oil switch can be used with constant-current transformers energized from distribution systems up to 7620 volts, and has 15-kv class insulation. *General Electric Co, Schenectady, N. Y.*

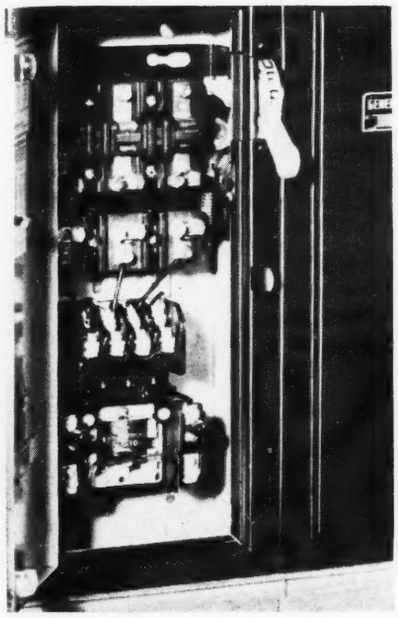
5



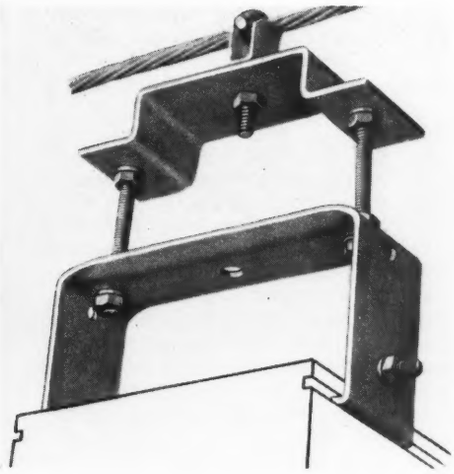
6



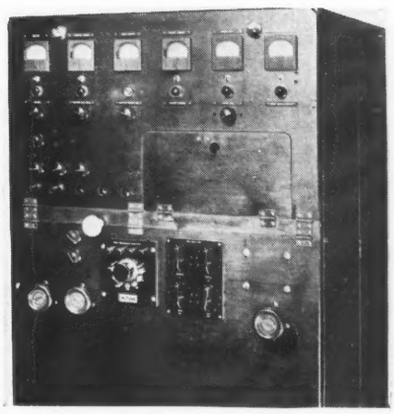
7



8



9



10

8 STARTERS — AC combination magnetic starters are for full-voltage starting of induction motors up to 7½ hp. Available so far only in NEMA sizes 0 and 1, units consist of a fusible motor-circuit switch and a magnetic starter incorporated in one unit to provide greater protection for equipment and operators and to improve appearance. To facilitate mounting groups of starters close together, operating handle is projected through cabinet front instead of side. *General Electric Co, Schenectady, N. Y.*

9 LAMP HANGER — Fluorescent lamp hanger simplifies hanging of continuous row fixtures. "Slide-Grip" hangers are mounted first; then fixtures are lifted section by section and snapped into place. Hangers offer wide variety of applications for chain, conduit, or messenger-cable mounting. *Sylvania Electric Products Co, Salem, Mass.*

10 SPECTROMETER—Unit is essentially a high-vacuum tube containing electrodes, filaments, slit system and an electron collector. Spectrometer gives direct information about relative abundance of different kind of molecularion fragments formed when molecules of a particular kind are struck by electrons of known energy. *Westinghouse Electric & Mfg Co, East Pittsburgh, Pa.*

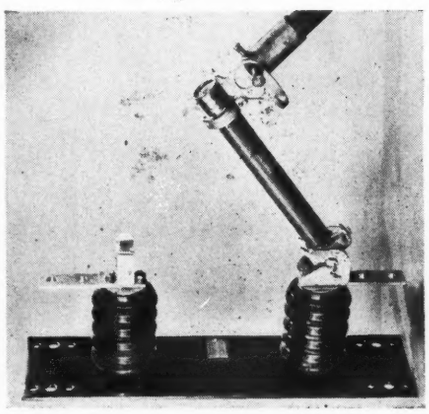
PHOSPHOR—For use in coating fluorescent lamps, phosphor said to produce more light and uses no cadmium or lead. In flourescent lamps, phosphor's function is to transform invisible ultraviolet rays into visible light radiations. New phosphor is said to maintain high lamp output. *Westinghouse Electric & Mfg Co, East Pittsburgh, Pa.*

11 TRANSFORMER FUSE — Type BAL fuse combines functions of a current-limiting resistor and a fuse in a compact unit for application on a system of high short-circuit capacity with none of the disadvantages of resistor and fuse combination. Can be safely applied on largest powerhouse bus, as well as on metering transformer of smallest substation. Interrupting ratings are from 80,000 amp at 2300 volts to 65,000 amp at 22,000 volts. *Westinghouse Electric & Mfg Co, East Pittsburgh, Pa.*

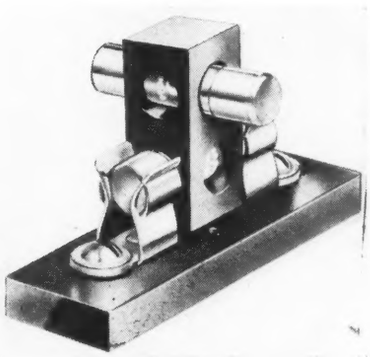
12 FUSE CHANGER—Spare fuse holder and puller combined, made for all normal applications. Fuse in circuit goes through one end of the soft rubber rectangular holder, between clips. Above, and at right angles, is an opening in the holder for spare fuses. When inserted, cap of spare fuse projects beyond holder. *Littelfuse, Inc, Chicago, Ill.*

13 SECONDARY PROTECTOR — Thyrite secondary protector is for use on current transformers to provide protection against high open-secondary-circuit voltages. Consists of a Thyrite disk connected across transformer secondary terminals, together with a thermostatically operated short-circuit switch. In operation, when external secondary circuit becomes accidentally opened, secondary current will pass through the Thyrite disk. When disk temperature reaches approximately 100 C the thermostat operates switch to short-circuit disk preventing overheat damage. *General Electric Co, Schenectady, N. Y.*

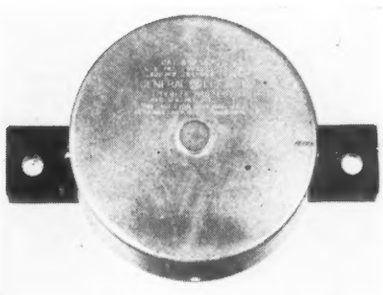
11



12



13



PIPING, FITTINGS AND VALVES

1 EXPANSION LOOP — Manufacturer announces that he can furnish expansion loops for any system and to any specifications as to kind of pipe, size or number of pipes required, insulation desired, etc, subject to government regulations. Loops furnished completely prefabricated and factory-sealed, and are available for underground or overhead service for lines inside or outside of building. *The Ric-wil Co, Cleveland, Ohio.*

2 CHECK VALVES—Improved line of check valves in wide range of metals and sizes. Designated as Williams-Hager flanged silent check valves, they are manufactured of bronze, cast iron, steel, stainless and Monel metal for pressures varying from 150 to 2500 lb, to meet American standards. Sizes range from 1 to 20 in., inclusive. Both valve disk and seat, only two parts subject to wear, are easily removable and renewable, and the valve can be reseated without special tools. *The Williams Gauge Co, 2055 Pennsylvania Ave, Pittsburgh, Pa.*

3 CONDENSATE SAMPLER — Device provides accurate means of sampling condensate for a conductivity cell which in turn connects electrically with a suitable measuring or checking instrument calibrated in direct-reading terms such as percentage of carry-over or soluble salts. Conductivity cell holder available alone for use with any type of condensate cooler or in combination with a new type cooler recently made available. Combination is arranged for easy installation. *Industrial Instruments, Inc, 156 Culver Ave, Jersey City, N. J.*

4 STRAIGHT AND ANGLE SWIVELS — Straight and 90-deg angle swivel is used in making oil, grease, air and other line connections between stationary and revolving, oscillating or other movable surfaces. Swivels are available in two constructions for different requirements. Ball-bearing swivels should be used if space permits, as they turn freely at any pressure. Light-duty swivels are built without balls, and are intended for lighter work. *Trabon Engineering Corp, 1814 E 40th St, Cleveland, Ohio.*

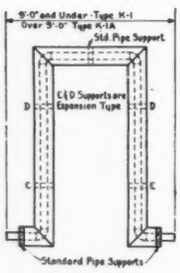
5 VALVE CONTROL—Newly designed unit for manual control of remote valves, dampers, and other pneumatically operated equipment announced by company. In appearance, unit harmonizes with rectangular case in which Foxboro recording and controlling instruments are now available. Unit is practical, maker says, for operation over distances as great as 1000 ft. *The Foxboro Co, Foxboro, Mass.*

6 BUTTERFLY VALVE — Solenoid-operated valve provides 2-position control —either automatic opening or wedge-tight shutoff in case electric power fails or is turned off. In an open position butterfly vane is held open by magnetic solenoid action. When electric power shuts off, trigger trips and counterweight closes butterfly vane by gravity, wedge-tight against valve body. Valve can be constructed of any metal alloy in various sizes for air, gas, steam, oil, hydraulic or other services. *R-S Products Corp, Wayne Junction, Philadelphia, Pa.*

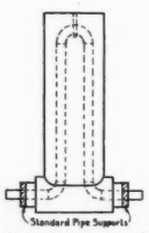
7 PIPE CLAMP—Style 77A band clamp repairs small pinholes, leaks and splits in straight runs of pipe. Clamp made up of heavy one-piece steel band of circular, split construction, with a riveted bolt lug at each end. Track-head bolt pulls ends securely. To install, clamp is sprung apart until it can be slipped around pipe and over gasket or packing; then it is bolted up to make a firm, leak-proof repair. A special cone gasket (furnished when specified) has two molded rubber tabs which aid in positioning the gasket. *Dresser Mfg Co, Bradford, Pa.*

8 WATER STRAINER — Brassert automatic self-cleaning strainer, developed originally for steel mills, now offered for general industrial and power-plant use, notably cleaning water for cooling or lubricating non-metallic bearings, hydro seal glands, boiler feed (ahead of softener and sand filters), condensers, heat exchangers, intercoolers, etc. Water under pressure passes from outside to inside of slowly rotating cone drum through many inserted screening disks of any desired mesh. Clear water discharges at bottom

1

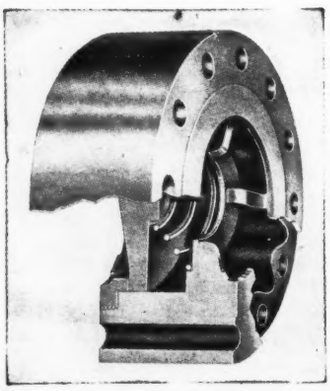


TYPE K-1

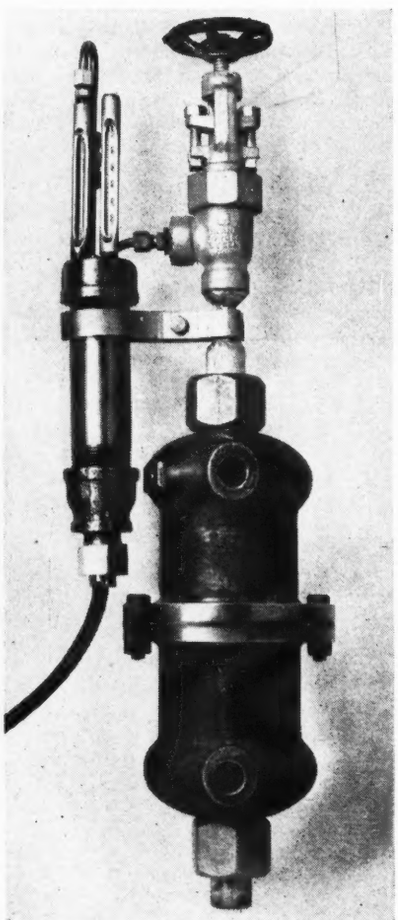


HAIRPIN EXPANSION LOOP K-2

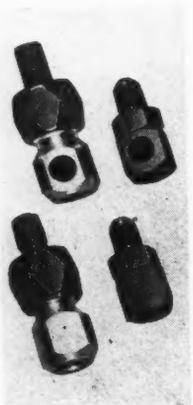
2



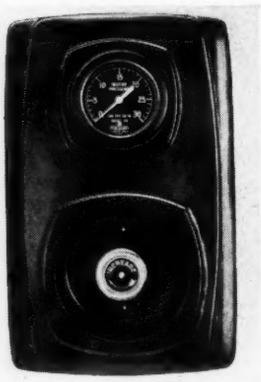
3



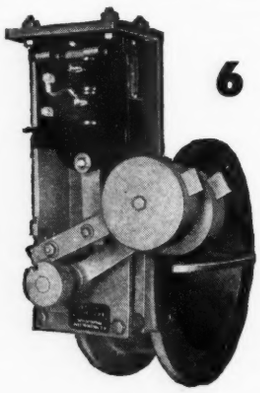
4



5



6



(sketch). Machined cone surface (lapped fit) slides past vertical internal slot in housing, where pressure in drum backwashes clinging impurities from passing strainer disks. Standard model safely withstands 125 psi and has rated head loss of 1½ psi. Normally backwash runs 2 to 5% of total influent water. *H A Brassert & Co, 60 East 42nd St, New York, N. Y.*

9 CAST-IRON TRAP—Type 17-D of new Hoffman series of cast-iron traps, illustrated, has a nominal capacity of 200 sq ft of direct radiation. Body and cap are made of cast gray iron, with lefthand thread inlet connection. Thermostat is of a special non-corrosive alloy which will not soften under temperatures far above those encountered in service, nor crack when subjected to repeated action. *Hoffman Specialty Co, 1001 York St, Indianapolis, Ind.*

10 INTEGRAL SEAT VALVES — Intex globe valves are specifically designed for high-pressure and high-temperature service (pressures to 1500 lb at 950 F). Disks and integral seat faced with Stellite. Valves available in ½ to 2-in. sizes in socket welding, flanged or screwed ends. *Edward Valve & Mfg Co, East Chicago, Ind.*

11 TRY COCK—Illustration shows Yarway heavy-duty try cock, built for high-pressure service. For pressures up to 600 lb, body and stem are tobin bronze, for 600 to 1500 lb, these parts are stainless steel, and are reversible and renewable. To avoid interference of operating chains, operating lever on upper try cock is offset outward, lever on center unit is straight, and lever on lower try cock is offset inward. *Yarnall-Waring Co, Chestnut Hill, Philadelphia, Pa.*

12 STEP VALVE—Improved plastics pump has step valve, inlet and discharge connections made entirely from transparent plastics. "Plexiglas" valve is unaffected by most inorganic solutions, and by acids and alkalies only in high concentrations. Single-piece cover plates for this plastics valve are readily removable without disturbing connections. Manufacturer states that this valve, similar to those made of corrosion-resistant alloys and other metals, is non-clogging, self-cleaning, and eliminates possibility of air-binding. *Milton Roy Pumps, 1300 East Mermaid Ave, Philadelphia, Pa.*

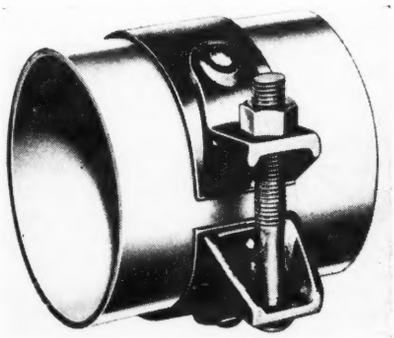
PLUG VALVES—"Lever-Seald" plug valves designed for 150 psi working pressure. Face-to-face dimensions of each valve in new line are the same as those of corresponding size wedge-gate valves and thus are instantly interchangeable with wedge-gate valves without piping changes. Sizes range from 1½ in. to 10 in. in semi-steel or steel. *Homestead Valve Mfg Co, Coraopolis, Pa.*

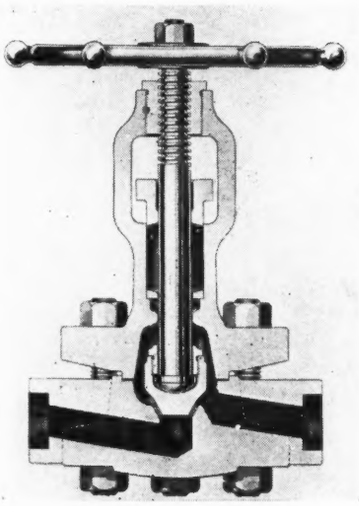
MECHANICAL SEAL—"Sealol" is mechanical seal for rotating shafts, with the initial sealing contact between the sealing ring and the hardened lapped face achieved by a light corrugated spring. Sealing against pressure maintained by the fluid pressure itself acting on two opposing surfaces of different areas. Assembly consists of only five parts, (1) pressed-steel retainer cup, (2) synthetic-rubber packing, (3) flat thrust washer, (4) corrugated flat spring, and (5) sealing ring. *Stevenson Engrg Corp, 45 Willard Ave, Providence, R. I.*

PIPE INSULATOR—Corrosion and leak-resistant pipe insulator developed for cable systems which require insulation between cable sheaths or joint casings and oil-supply reservoirs connected to joints and terminals. Small annular channels provided in plastic portion of insulator. In these are molded gaskets of rubber. These gaskets form tight seal between plastic and brass of inserts, preventing development of any leak because of differential expansion and contraction. *General Electric Co., Schenectady, N. Y.*

BUTTERFLY VALVE—Three-way butterfly valve for mixing and quick interchange service, is adapted to fully automatic control by means of an air diaphragm motor or hydraulic cylinder. Valve is of cast steel or cast iron for pressures up to 600 psi. When desirable, special metals for resistance against heat, abrasion and corrosion can be substituted. Special feature is self-cleaning, double-beveled, streamlined vane. This seats wedge-tight against the body of the valve, producing a tight shutoff and a positive control of volume and pressure. *R-S Products Corp, Wayne Junction, Philadelphia, Pa.*

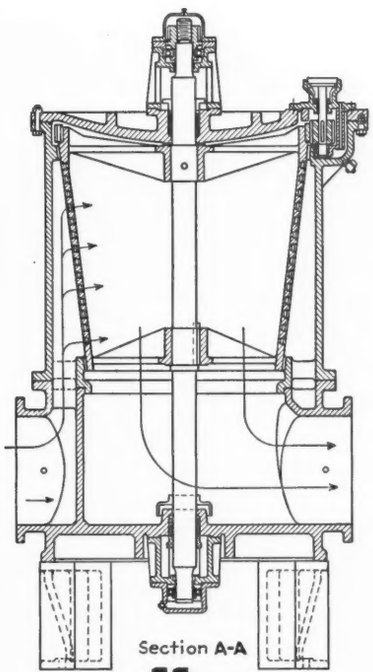
7





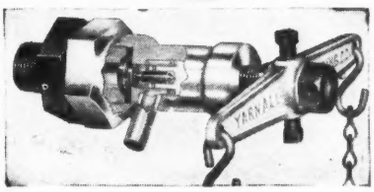
10

8

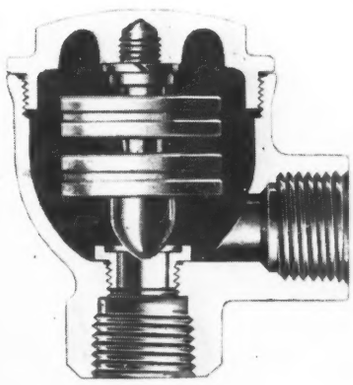


Section A-A

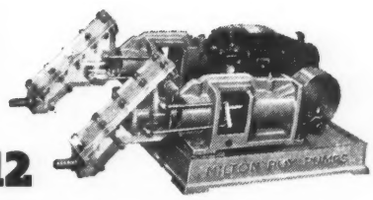
11

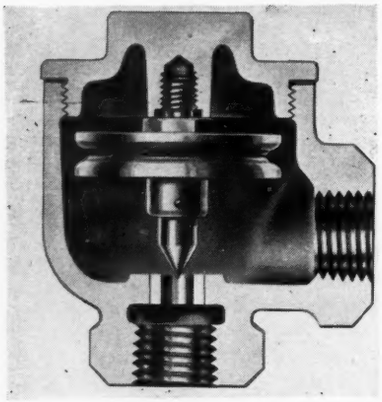


9

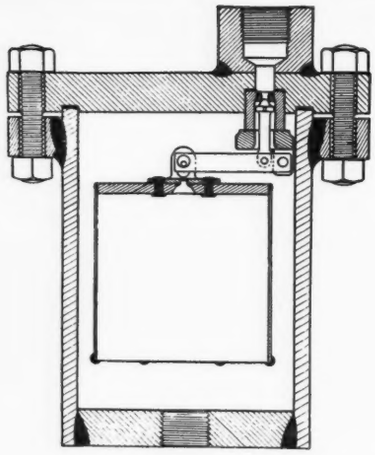


12

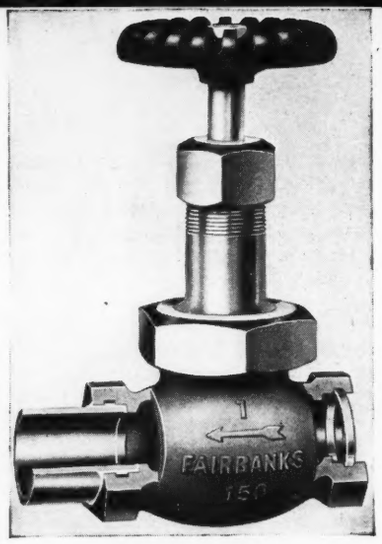




1



2



3

1 RADIATOR TRAP—"Old Ironsides" line of wartime radiator traps and valves features cast iron bodies and bonnets in natural finish for painting after installation. Nickel and other plating eliminated. Brass formerly used in trap and valve bodies, caps, nuts, etc, is conserved. New trap and valve are designed for connection to the radiator with a right- and left-hand pipe nipple. *Warren Webster & Co, Camden, N. J.*

2 HIGH-PRESSURE TRAP — Welded steel high-pressure trap is for draining lines up to 600 psi 750 F. All operating parts are of "Strong" design and construction, including bucket. *Strong, Carlisle & Hammond Co, Cleveland, Ohio.*

3 BRONZE VALVES Faircoseal bronze valves contain pre-inserted rings of Sil-Fos silver brazing alloy in the port openings, instead of threads. With this design, valve and pipe can be easily brazed together, forming a Silbraz joint. *The Fairbanks Co, New York, N. Y.*

4 STRAINER — Fine-screen strainer made in six standard sizes ½ to 2 in. with three improved features: (1) plating inside and out for rust protection, (2) screen of special Monel wire, and (3) straight thread and machined face on blow-off bushing for easy removal and replacement. *Yarnall-Waring Co, Chestnut Hill, Philadelphia, Pa.*

5 PIPE SUPPORT—Reintjes casting designed primarily for support of arch-supporting tubes, with a modified hanger for pipe work. Modified unit not illustrated. Entire line of supports can be put in place before erection of any pipe, pipe hoisted into position, and U-section slipped beneath pipe and locked securely. *Geo P Reintjes Co, 2517 Jefferson St, Kansas City, Mo.*

PUMPS

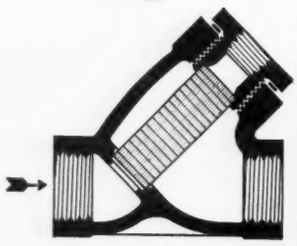
6 ROTARY PUMP—Vertically mounted Blackmer pump has typical "Bucket Design" principle, and with the exception of minor changes in design necessary to allow for vertical mounting, is standard Black rotary pump. Unit now in production has capacity of 150 gpm at 100 psi, powered by a 15-hp gearhead motor. *Blackmer Pump Co, Grand Rapids, Mich.*

7 FORCED INDUCTION PUMPS—"Pile Driver" pumps dispense heavy, viscous materials such as sealing compounds, sound deadeners, insulating materials, etc, and other substances too heavy or solid to prime in any other type of pump. Unit available in single- or two-stage model, both employing standard Lincoln air motor. *Lincoln Engrg Co, 5701 Natural Bridge Ave, St. Louis, Mo.*

8 PUMP UNITS—Special-duty pump unit affords small plants and towns adequate fire protection at moderate cost. Unit consists of 4-in. fire pump driven by a 2500-rpm, dc, Ford-Mercury engine which eliminates expense of gear drive. *Fairbanks, Morse & Co, 600 S Michigan Ave, Chicago, Ill.*

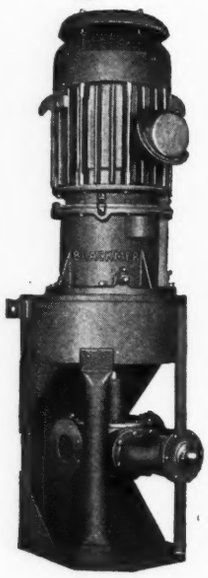
9 PORTABLE PUMPING UNIT — Portable pumping unit may be adapted to a variety of services, consists of a 2-in. non-clogging F-M sludge pump, direct connected to a 3-hp F-M splashproof motor, mounted on a standard truck. Pump primed by hand-operated bracket-type pump mounted on truck platform with suction connected to volute top through a ¾-in pipeline equipped with a shutoff valve. *Fairbanks, Morse & Co, 600 S Michigan Ave, Chicago, Ill.*

10 TURBINE PUMP — Higgins turbine pump said to handle more than 200 gpm. Pump with either right- or left-hand rotation made in the 1¼-in size only. Pump

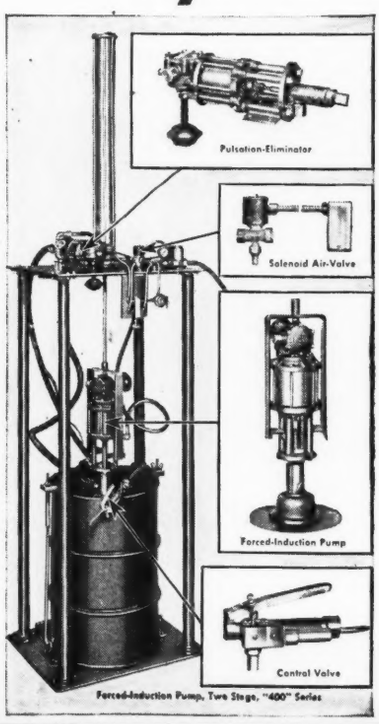


4

5

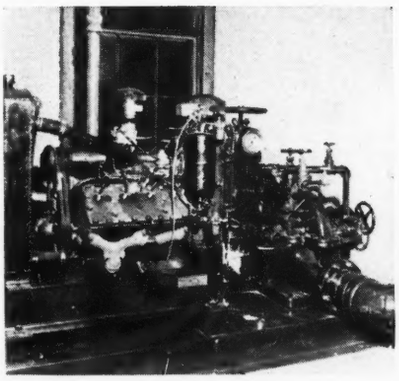


6

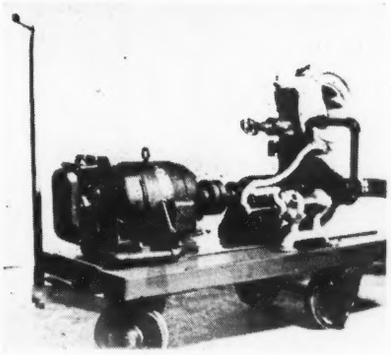


Forced-Induction Pump, Two Stage, "400" Series

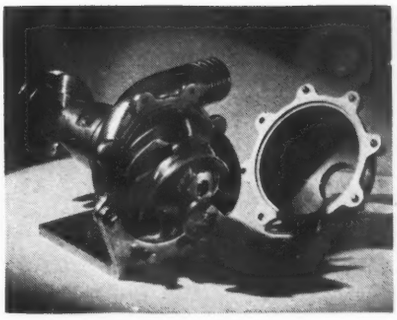
7



8



9



10

is not self-priming and requires a position on the installation that will keep it primed, or a storage tank or foot valve to keep it wet. Pump weighs 20½ lb complete with V-belt pulley and is constructed of bronze case and impeller with Monel metal shaft running in sealed ball bearings. *Higgins Industries, Inc, 521 City Park Ave, New Orleans, La.*

11 ADJUST-O-FEEDER — Proportioneers units now being equipped with cylinder support frame carrying new fluid-sealed yoke as well as incorporating other features. These include micrometer stroke adjustment feature, consisting of micrometer screw in slotted crank having large knurled thumb nuts at each end for easy and exact positioning of crankpin throw and displacement capacity. Fluid-sealed yoke (not shown in illustration) permits use of inclosing fluid around plunger and stuffing gland. Extra-deep stuffing box with replaceable bushing allows for adjustment. *Proportioneers, Inc, Providence, R. I.*

12 HOT-LIQUID PUMP—Midget pump is compact and can handle hot liquids up to 500 F. Pump can be used in industrial, pilot plant, laboratory and experimental applications where thin liquids at temperatures up to 500 F are to be handled. It is a centrifugal pump, weighs 7 lb, and is powered by a 1/20-hp Universal fan-cooled motor for 115 volts, ac or dc. *Eastern Engrg Co, 45 Fox St, New Haven, Conn.*

13 HYDRAULIC PUMP — Illustration shows 6-plunger fully inclosed hydraulic pump. All moving parts pressure lubricated and connecting rods run in a continuous oil bath. Roller bearings used throughout. Maximum pump capacity 400 hp. Herringbone gears, running in a continuous oil bath, used for driving the pump, insuring long gear life. *Charles F Elmes Engrg Works, 230 N Morgan St, Chicago, Ill.*

14 PUMP—Jabsco pump has Neoprene rubber impeller and can handle thick and thin liquids. Impeller fits snugly inside housing and creates near-vacuum, eliminating priming. *Jabsco Pump Co, Wilshire Blvd, Los Angeles, Calif.*

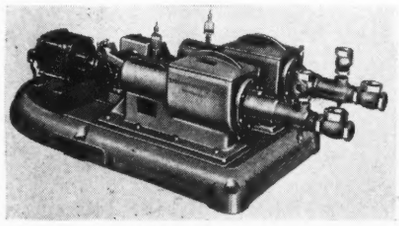
STRAINERS — Supplementing regular line of pumps and accessories, company has issued a series of strainers for pipe sizes from 1 to 6 in., which incorporates in their design a number of improvements over the conventional strainer. While designed primarily for use in the company's rotary pumps, they are just as well suited to applications with all types of pumps or wherever a strainer is applied in a piping layout. *Blackmer Pump Co, Grand Rapids, Mich.*

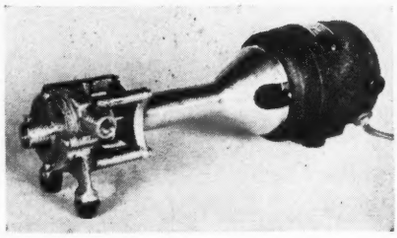
ROTARY PUMPS — Complete line of direct-connected rotary pumps recently announced. Known as the "D-C" line, pumps are furnished in standard capacities of 5, 10 and 20 gpm, for pressures up to 100 psi. They will deliver rated capacity at operating speed of 1800 rpm. Standard units consist of pump mounted on bedplate with flexible coupling for direct connection to an electric motor, steam turbine or gasoline engine. *Blackmer Pump Co, Grand Rapids, Mich.*

PUMPS—Company announces 25-hp unit as addition to its recently introduced Electrifugal pumps. Like other smaller units in the line, new pump built as one unit, with both motor and pump on one shaft and in one housing. This is said to result in more perfect shaft alignment, less vibration, less wear, easier installation and lower pumping cost. *Allis-Chalmers Mfg Co, Milwaukee, Wis.*

DUAL-PURPOSE PUMPING UNIT — Combination rotary-centrifugal dual pumping unit has been added to company line. New unit mounted on a cast bedplate, powered by a 4-hp 3-phase, 60-cycle mo-

11

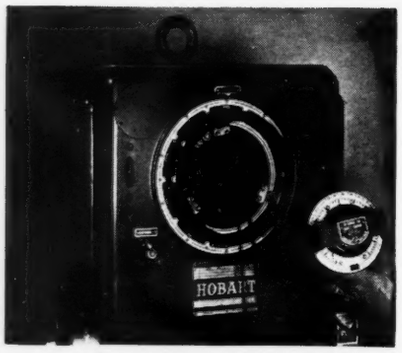




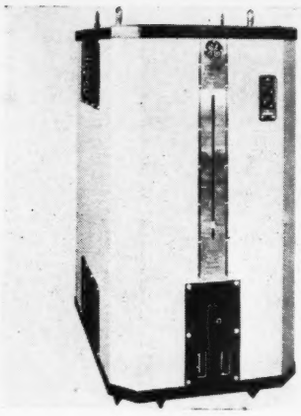
12

13

14



1



2

3

tor with gearhead on one end to drive rotary pumping unit, and a shaft extension on the other end, direct-connected to a centrifugal pump. Rotary unit has capacity of 44 gpm at 50 psi, handling lube or fuel oil, while the centrifugal unit has a 75-gpm capacity at 25 psi, handling water. *Blackmer Pump Co, Grand Rapids, Mich.*

WELDING

1 WELDING CONTROL — Remote-control unit now standard production feature of all welders made by the company. Improved control said to be protected fully from accidental breakage by a metal pull-out handle set over the control dial, and by cushion springs on the back of porcelain rheostat. Large outer-control dial shown in the picture is field rheostat which controls differential compounds—while remote-control unit adjusts open-circuit voltage. Many combinations of voltage and current possible with dual-control dial. *Hobart Bros Co, Troy, Ohio.*

2 WELDING TRANSFORMER — Heavy-duty ac welding transformers especially designed for Uniomelt welding announced by company. Available in 750 and 1000-amp sizes for 220-, 440- and 550-volt power. Motor-operated, remote adjustment of the welding current permits operator to make current adjustments without leaving work. *General Electric Co, Schenectady, N. Y.*

3 END BRUSH — Power-driven end brush is to facilitate cleaning of slag, scale or oxidation from welds on inside corners, as well as other locations difficult to reach. New brush will get into any space accessible for welding, taking no more room to manipulate than welding tools. Important feature of new brush is that it can be used in all standard power tools, whether air or electric. *Osborn Manufacturing Co, Brush Div, Hamilton Ave, Cleveland, Ohio.*

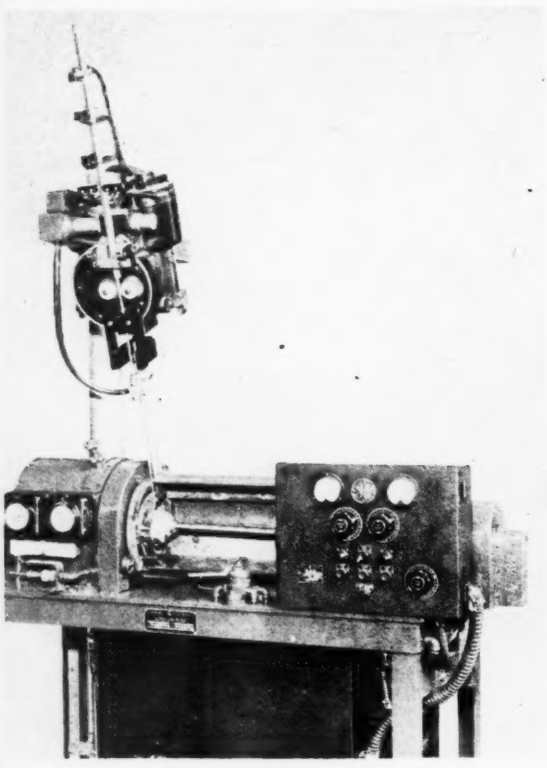
4 AUTOMATIC ARC-WELDING EQUIPMENT—Complete equipment for automatic arc welding with heavily coated electrodes in cut lengths has been announced. Mechanism includes a clamp used for holding any standard stick electrode and transmitting current to the electrode. Clamp is attached to the feed-rod end upon which two feed rolls operate to maintain proper arc voltage through automatic thyratron control. Limit switches govern extreme of movement. *General Electric Co, Schenectady, N. Y.*

5 ARC WELDER—Strike-Easy, 150-amp dc arc welder announced for use in fabricating bright-surfaced, thin-gage metals. Has instantaneous voltage recovery, which helps operator strike arc with ease under difficulties presented by thin metals having bright polished surfaces. Rapid adjustment of welding current also by tap switch and rheostat. *General Electric Co., Schenectady, N. Y.*

6 ARC-WELDER CONTROL — Improved and simplified design of company's "dual continuous control" for arc welding machines eliminates need for meters show-

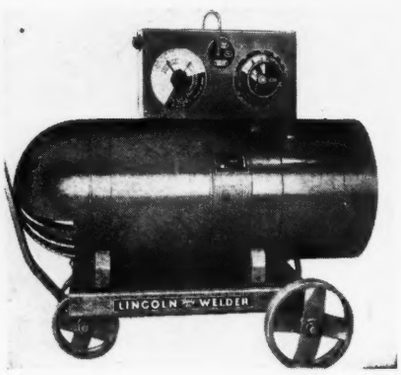
(Continued on page 112)

4

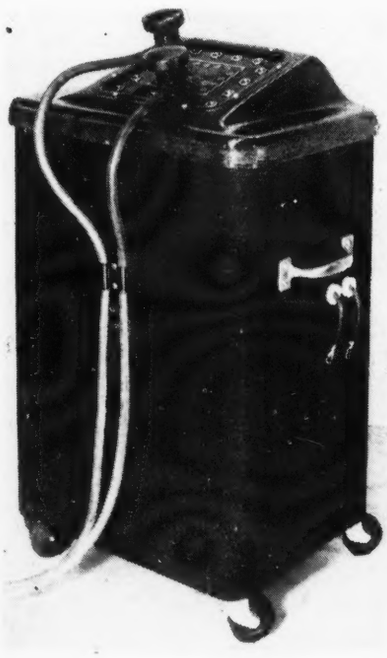


5

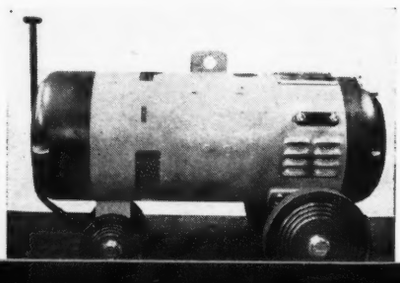
6



7



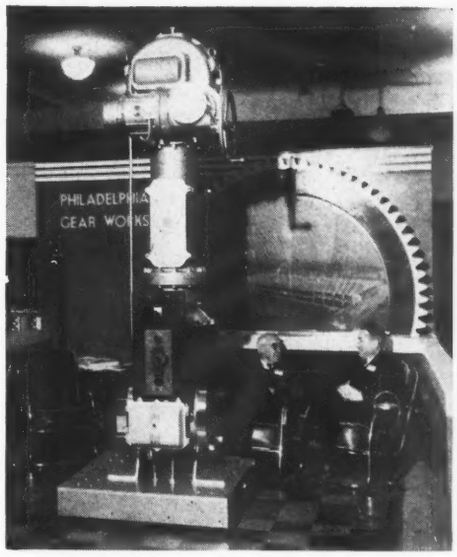
8



Power Show Reflects War's Effect On Industry

▶ REVEALING MUCH that is new and many improvements for producing and utilizing power together with processes, devices and tools designed to speed the war effort, the Fifteenth National Power Show was held simultaneously with the ASME convention in New York City. This year the show was held in the exhibition hall of Madison Square Garden, the Grand Central Palace, where the show was held previously, being devoted to war purposes.

The show reflected the effects of the war in the small size, number of exhibits and attendance, even though the field of power-generation and utilization equipment was well represented. Groups of equipment exhibited included meters, automatic combustion control, pressure and temperature regulators, heat-insulation and refractories, fuel-burning equipment, coal and ash handling equipment, copper and brass products, lubrication, piping, pumps, air compressors and mechanical-power-transmission equipment. A "What we are doing to help win the war" flavor was added in several ways but the substitution of less-essential materials for those strategic to the war effort was predominant. Other photos of the Power Show on page 98.)

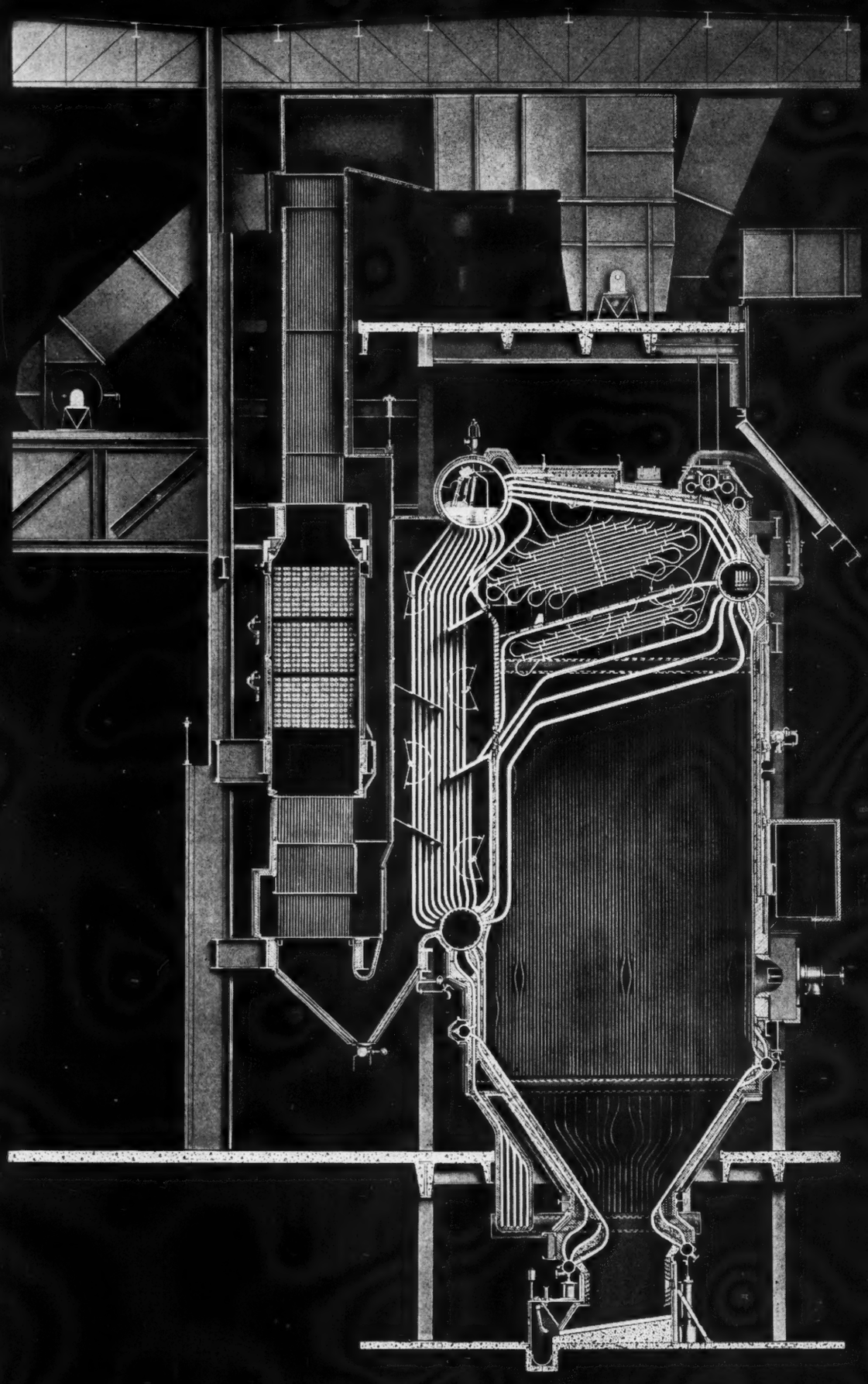


This type of high-speed electric valve operator can close a 24-in. valve in 3 sec, and seat the valve with a predetermined pressure without danger of jamming

This automatic combustion-control equipment is actuated by electronic relays and an electric eye

Here a sectionalized furnace wall was demonstrated, each section being suspended on steel columns

Underfeed and overfeed stokers for boilers up to 10,000 sq ft of heating surface featured this the largest fuel-burning exhibit at the show. The underfeed stoker is a screw conveyor type and the overfeed a pneumatic-spreader type



Pulverized Coal Fired

RILEY STEAM GENERATING UNIT

If you install Riley Boilers you can keep them on the line

The continuity of operation and availability of Riley Units is of even greater importance today.

Here are a few actual examples which emphasize the dependability of Riley Units.

A Riley Unit, the largest in the steel industry, carrying loads up to 470,000 pounds of steam per hour with blast furnace gas, has been in operation for over 12 months with no necessity for coming off the line other than annual insurance inspection.

An oil fired Riley Unit, carrying the entire load of an eastern chemical plant, operating at full capacity 24 hours per day, stayed on the line for over 18 months while obsolete equipment was being removed and replaced with new Riley Units.

A Riley Unit in a midwestern public utility burning pulverized Illinois coal is regularly on the line 14 months at a time and then taken down only for routine check-up and inspection.

An outdoor Riley "RO" installation without any protection from the weather whatsoever has operated over 20 months without shut-down at 112.5% of guaranteed maximum capacity.

At a large central station in the northwest their Riley Unit, installed in 1930, has been on the line continuously for over 16 months, carrying the entire plant load without a shut-down.

A Riley Stoker fired unit in service for 7 years has regularly carried loads from 12 to 13 months continuously before being taken off the line for routine inspection.

In all of these cases the Riley Units have been taken off the line merely for routine inspection and not because of necessary corrective work.

Unusual availability is assured with Riley Units because of the careful attention to and correct engineering of each minute detail of design and construction. Adequate circulation is assured to prevent damage to tube surfaces, complete protection is normally afforded refractory surfaces, furnace volume and water cooling is ample to prevent slag difficulties, expansion and contraction provisions are correctly provided, maintenance is reduced to a minimum.

Performance of existing installations in excess of guarantees and expectations has been the reason for the definite swing to Riley Steam Generating Units.

RILEY

STOKER CORPORATION, WORCESTER, MASS.

Boston New York Philadelphia Pittsburgh Baltimore Buffalo Cleveland Detroit Chicago St Louis Cincinnati
St. Paul Kansas City Denver Seattle Portland Los Angeles Houston New Orleans Atlanta Memphis Richmond

COMPLETE STEAM GENERATING UNITS

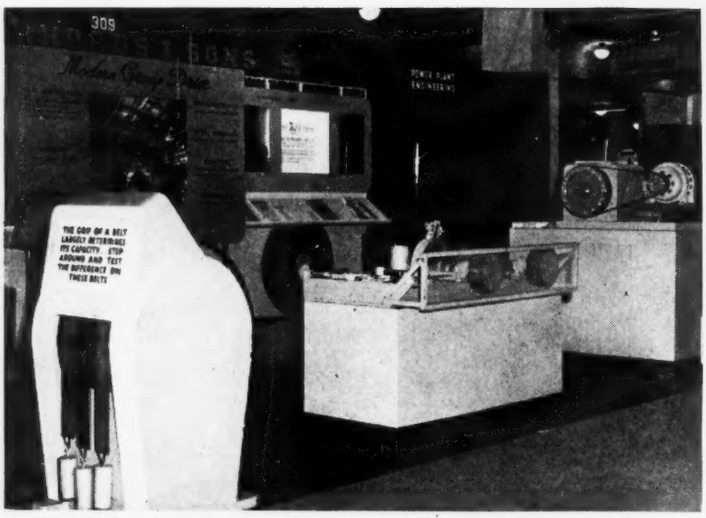
BOILERS • PULVERIZERS • BURNERS • STOKERS • SUPERHEATERS • AIR HEATERS • ECONOMIZERS
WATER-COOLED FURNACES • STEEL-CLAD INSULATED SETTINGS • FLUE GAS SCRUBBERS

Power Show Continued

Mechanical-power-transmission equipment companies were the largest group of power exhibitors. Practically the whole industry was represented, including gears, chains, flat and V-belts, anti-friction and sleeve bearings, variable-speed transmissions, shafting and pulleys, automatic belt tension devices and combinations of gears and belts.

A group of V-belt sheaves made of hard wood instead of steel featured this exhibit, an example of substituting less-essential materials for those badly needed in the war effort (right)

This flat-belt exhibit demonstrated how the grip of a belt on its pulley largely determines its capacity, also how pivoted motor bases improves short-center flat-belt drives (below)



A reduction gear unit with a pulley that can be mounted directly on the driven shaft and automatic tension bases for short-center belt drives featured this exhibit

This group of variable-speed transmission, one of the largest and most instructive exhibits, demonstrated a wide range of equipment to meet practically every speed adjustment need in small and medium-size applications

Men, Machines and Power Line Up for Victory

ONE YEAR AFTER PEARL HARBOR, with most of the world at war, more than a thousand engineers attended the annual meeting of the American Society of Mechanical Engineers (Hotel Astor, New York, Nov 30-Dec 4) to swap ideas and speed victory by better organizing the nation's men, machines and mechanical power.

The notable emphasis on the human element was well timed to meet the acute manpower problems that loom ahead for 1943. Widespread interest in this subject was evidenced by the attendance of several hundred at an "Ingenuity luncheon" featuring Igor I Sikorsky, engineering manager, Vought-Sikorsky Aircraft, and inventor of the first practical helicopter—the machine that rises straight up, requires no landing field, can hover and fly backward.

Sikorsky and other speakers at the luncheon did much to dispell the common notion that engineers work only by mathematics and logic. All agreed that the creative engineer, like the great painter, musician or poet, makes heavy use of feelings and hunches he himself cannot explain—that his designs employ principles that won't be made clear in textbooks for another half century.

Other speakers at this trail-blazing session were President A R Cullimore, Newark College of Engineering, President C I Barnard, New Jersey Bell Telephone Co, Secy L Langner, of Inventors Council and K K Paluev of General Electric.

The keynote was "intuition", which Sikorsky pictured as a partly developed "supersense" permitting certain men to see beyond the time boundary of the moment. In a brilliant discussion the various speakers urged educators not to stop with the logic of engineering (the foundation of analysis), but fan the sparks of ingenuity and intuition, which must become a living flame in every creative engineer.

Discovering Initiative

What to do about this was the subject of an evening session—a panel discussion on "discovering and encouraging originality, initiative and resourcefulness in young Americans". Alonzo O Grace, Commissioner of Education, Conn., pleaded for greater recognition of the vocational school—too often neglected in favor of less-effective academic schooling. President Arthur D Harper of Wyomissing Polytechnic Institute showed how the regional technical institute combines theory with practice and gives the average poor boy a chance to earn while learning. Paul B Eaton, Lafayette College, urged a return to sounder teaching methods—less "talking at" students and more student participation. James N Landis, Consolidated Edison, asked ASME local sections to give a lift to prospective engineers in nearby high schools and colleges by organized or personal contacts.

W E Johnson and P P Paluev, both of General Electric, outlined the job of progressive industry in developing originality. In General Electric courses, they pointed out, students are given special exercises to develop inventiveness—for example, an assignment to lay out linkages for typewriting music. A truly all-round creative individual, that is a man in the top 20% of each of the 15 abilities required for success in creative work, occurs only once in ten million times, said Mr. Paluev. He then developed his concept of a *synthetic genius*, a *team* in which each man has certain abilities and the group

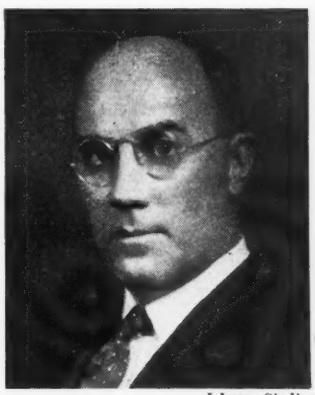
Underwood & Underwood

HAROLD V COES

New ASME president is ASME Fellow and Vice President of Ford, Bacon and Davis, Inc, a graduate of Mass. Institute of Technology, his early engineering experience included chemical plant construction, gas equipment manufacturing, industrial engineering in munitions plants, heavy equipment making. He has long been active in ASME affairs and is the author of many papers on economics, management, materials handling and production

THESE MEN BECOME VICE PRESIDENTS FOR 1943

W J Wohlenberg



Johnson Studios

T E Purcell

G T Shoemaker

Mercer Wilson Photo

J W Eshelman

E G BAILEY HONORED

The annual dinner, attended by more than 1200 members and guests, was notable in the eyes of power men particularly because of the honor conferred on their fellow worker, E G Bailey, president of Bailey Meter Co and Vice President of Babcock and Wilcox Company. Mr Bailey, known throughout the world for his pioneer work in boiler design, combustion and power-plant instrumentation, was given the Society's highest award, the ASME Medal for "achievement and leadership in steam and combustion engineering".

all abilities required to invent, develop, perfect, finance, promote and sell.

High spot of this session was the paper "Pride of America" by Dean A A Potter of Purdue and executive director, National Patent Planning Commission. Listing great inventions and inventors. Dean Potter said that America has excelled all other nations in new mechanical creations and that this has been the major factor in our high standard of living. Primary credit for this fertility he gave to the American patent system.

Winding up the week was the Friday luncheon devoted to "manpower problems of the engineering level". Presiding was Harvey A Davis, past president of the ASME, president of Stevens Institute of Technology and newly appointed director of the Office of Production Research and Development, War Production Board. Speakers included Dean J W Barker, Columbia; Supt G R Brown, Western Electric Co; President E C Elliott of Purdue; L J Fletcher, Director of Training, Caterpillar Tractor Co; E L Little, Director National Selective Service, Canada; Vice President P B Taylor, Wright Aeronautical Corp. This discussion attacked the problem of meeting the growing shortage of engineers.

More than 1200 members and guests attended the annual dinner, featured by the presentation of the ASME Medal to E G Bailey (see box on this page). Other awards at the dinner were:

Pi Tau Sigma Medal to John T Rettaliata for outstanding achievement in mechanical engineering; Junior Award to Winston M Dudley; Melville Medal to J Kenneth Salisbury; Worcester Reed Warner Medal to Fred H Colvin, editor emeritus of American Machinist; Holley Medal to Ernest O Lawrence, originator of "cyclotron"; The Melchett Medal of the Institute of Fuel to A C Fieldner, Bureau of Mines.

Other features of the dinner were the presidential address of James S Parker and "Arms and the Changing Tide of War" by Major General Levin H Campbell (Chief of Ordnance).

Mr Parker, well known in power circles as vice president and chief engineer of Detroit Edison, said people everywhere are in a thoughtful mood and intent on doing a better job in national affairs. He believed the future would have a great need for men with broad training in technical fundamentals. Concluding, Mr Parker said leadership in America should no longer be delegated to professionalized politicians and economists.

Coes Becomes President

Retiring at this meeting, power engineer James W Parker passed the presidential gavel to Harold V Coes, who worked his way up in manufacturing and engineering to become vice president of Ford, Bacon and Davis, engineers, New York.

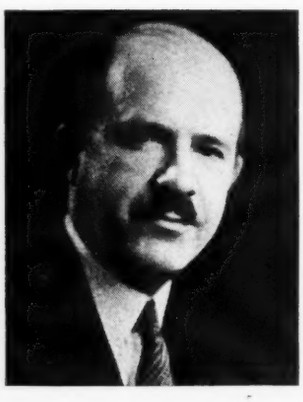
The power field was well represented among the incoming vice presidents and managers (see photographs). J W Eshelman of Eshelman and Potter, has done much work on combustion, fuel conservation and metering. Guy T Shoemaker is vice president of Kansas City Power and Light Co. Prof Walter J Wohlenberg of Yale is well known for his research and consulting work in the fields of heat transfer and steam and power generation. Thomas E Purcell holds two key power jobs: general superintendent of power stations for Duquesne Light Co and general superintendent of Allegheny County Steam Heating Co, both in Pittsburg, Pa.

Prof R W Morton heads the department of engineering at the University of Tennessee and is director of the University's central power station. Prof Albert E White, Michigan, has done much to make boilers safer and more efficient by his long service in the field of boiler metallurgy and chemistry. A R Stevenson, Jr, staff assistant to General Electric vice president, has a background in the manufacturing and application of power equipment.

THE NEW ASME MANAGERS

Ainson Studios

Roscoe W Morton



A R Stevenson, Jr

Rentschler Photo

A E White

Experience With Forced-Circulation Boiler

Clark, Rosencrants and Armacost* detail design and operation of America's first commercial forced-circulation steam generator

▶ HAVING SOME 85% greater steaming capacity than any previously constructed forced-circulation boiler, this country's first small-tube pump-circulated steam generator operates at higher steam pressure and temperature than any of similar European practice. At 1825 psi and 960 F this boiler supplies 650,000 lb per hr to a 25,000 kw superposed turbine in a 1923 central station already containing two 375-psi 750-F turbines totalling 75,000 kw.

At 1825 psi water at the boiling point weighs about 40 lb and saturated steam 4.75 lb per cu ft. With distance from furnace floor to bottom of main drum limited to about 60 ft, natural circulation designs were subject to some doubt, possibly unjustified, as to satisfactory operation under the conditions imposed. The forced-circulation design finally adopted was supported by experience with several hundred units operating in Europe, on land and sea, of capacities up to 350,000 lb per hr.

Boiler Construction

The boiler differs in construction from conventional natural-circulation units in that pumps take boiler water from the boiler drum through two 14-in. downcomer connections and discharge it to the bottom furnace-wall headers. Flow of water through each tube element is fixed at a predetermined proportion of the total volume by an orifice inserted at the point where the tube emerges from the bottom header.

Operation of the boiler is not influenced by the forced- and controlled-flow features. Burners, draft system, feedwater regulation, blowdown and other boiler functions are operated and controlled in identically the same way as would apply to a natural-circulation unit of comparable design. The circulating pumps introduce minor variations in the routine of placing the unit in service, but once on the line the attention given circulating pumps is comparable with that necessary for fan operation, in fact, less because no attempt is made to control pump flow either by speed control or throttling.

The boiler is protected against failure of circulation by dual drive on two of the three pumps so arranged that the turbine picks up automatically if the motor fails. Two pumps are normally required so that at least one of the dual-drive pumps is always in operation. The worst that can happen in event of pump failure is an automatic shutdown of the fuel supply by automatic control similar to that which would be called into play by failure of a forced- or induced-draft fan.

One Pump Sufficient

One of the 3500-gpm 50-psi-head pumps is sufficient to protect heating surfaces in emergency but two normally operate. Pumps are overhung-impeller type with a single water-cooled gland comparable with long established practice for high-pressure boiler-feed pumps. Steam equivalent of pumping energy is approximately 0.3% of boiler output.

Furnace tubes, 1¼-in. outside diameter, account for 5% of the total heat absorption of the steam generator. All tube connections to headers and to boiler drums are welded; there are no rolled joints. Removable strainer-and-orifice assemblies, screwed into lower wall headers, apportion flow to each tube and thereby prevent hot spots.

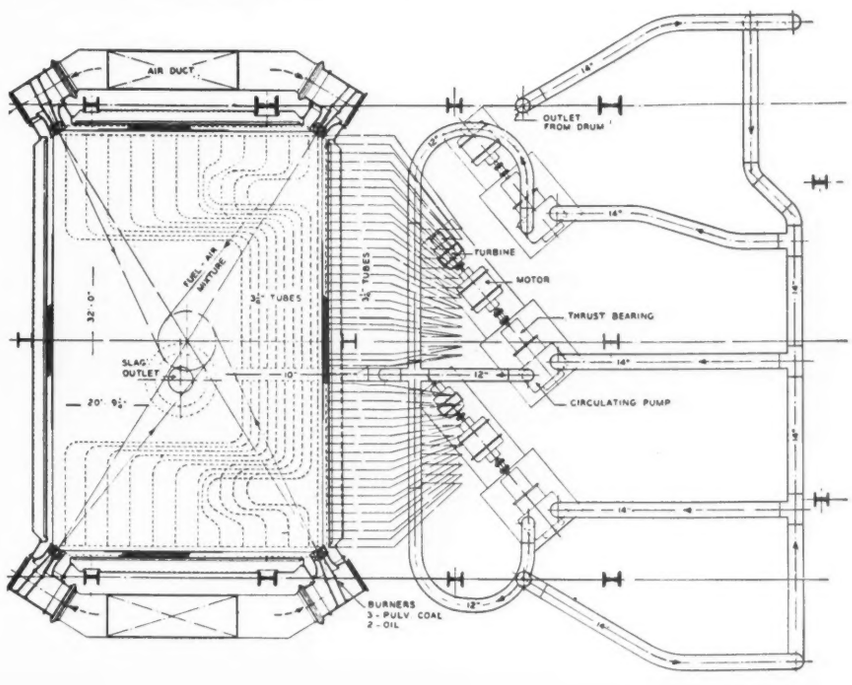
Present operation, practically continuous since Oct 16, is limited to 17,500 kw on the turbine, corresponding to about 480,000 lb per hr on the boiler, pending further adjustments to the bypass reducing valve and feedwater regulators. During preliminary operation some leaks in valve bonnets and other auxiliary equipment were corrected and modifications were made to the drum internals to improve a condition of carryover at high water and high concentrations.

One defective tube failed by a wide-open rupture with no evidence of overheating. A new section about 5-ft long was welded in. A dozen or so plugs opposite screen-and-orifice assemblies leaked but were made tight without reducing pressure or load. No leaks have occurred on welded joints, on manhole covers or safety valve flanges.

Some difficulty was experienced with the labyrinth packing on one of the three circulating pumps, necessitating replacement. During preliminary operation it was found necessary to lap in the high-pressure safety valves and water column fittings for tightness.

Observed performance indicates that proportions of heat-absorbing equipment and fan system are on the generous side and also that regulation of superheat and reheat temperatures corresponds to anticipated performance with some margin to spare. Troubles that have arisen in the relatively brief period of operation have not been such as to cause concern for the future.

Two of the three circulating pumps are dual driven and so arranged that the turbine picks up load automatically if motor drive fails. Pumps draw off and return the full water content of the boiler about once a minute at 50-psi head



* F S Clark, Stone & Webster Engineering Corp, F H Rosencrants and W H Armacost Combustion Engineering Co.

Instruments Supervise Steam-Turbine Operation

▶ PROPER APPLICATION and use of turbine supervisory instruments promotes efficient operation and prolongs power-generating equipment life, explained J L Roberts and H M Dimond. Equipment is available to record turbine conditions in terms of shaft eccentricity, bearing vibration, shell expansion, speed and camshaft position, and to detect interference. All these values assume importance in the proper operation of a turbine during starting, running, and shutdown periods. When unusual conditions prevail the turbine operator will be able to make changes in his procedure to prevent unnecessary wear which might otherwise occur.

The figure shows records taken during a normal starting sequence on an 80,000-kw turbine. As shown by the speed record, steam was first applied to the turbine at 4:03 a. m. and the speed raised to approximately 350 rpm and held during the warming-up period. During this time the shell expansion changed little, and the eccentricity remained constant at 3 mills. Beginning at 4:40, turbine speed was gradually increased until full speed was reached at 5:20. During this period, eccentricity and shell-expansion changes were normal. The turbine then ran at full speed for 30 min without load, but an oil-trip test of the emergency governor was made after the first 20 min of this period.

At 5:48 a.m. the machine was connected to the line and the speed and camshaft-position recorder automatically switched from speed recorder to camshaft-position recorder. The machine was then gradually loaded until full load was reached at 9 a.m. During the loading period, expansion was uniform and eccentricity and bearing vibration normal. From the first steam application to the beginning of the loading period 1.75 hr elapsed.

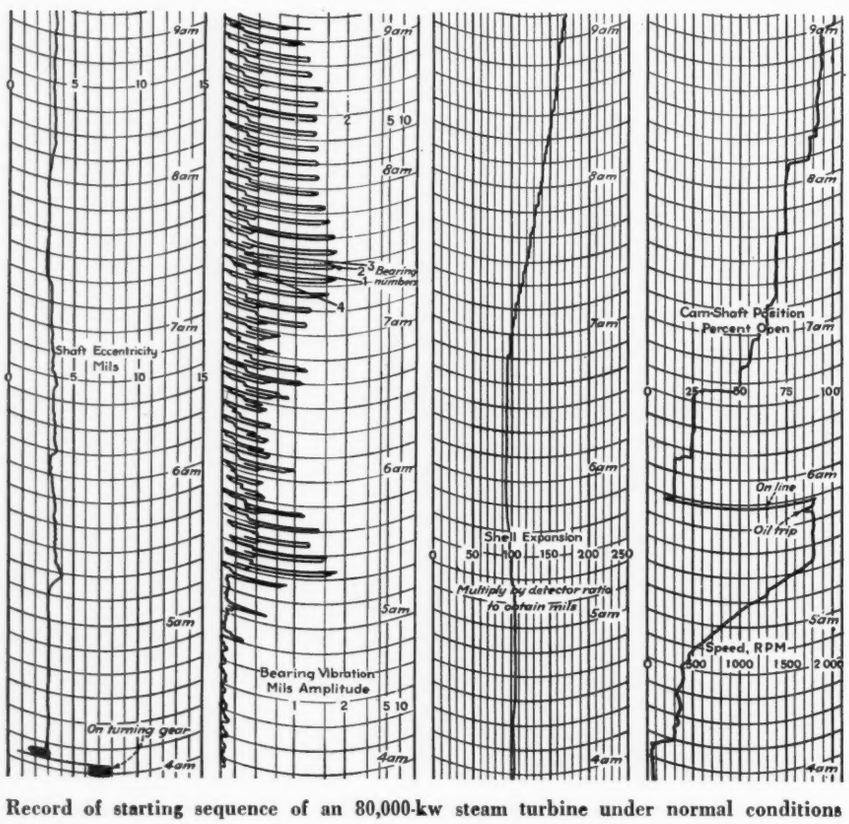
The authors called attention to a case when a machine was started under abnormal conditions, with 6-mills shaft eccentricity, the turbine shell having retained more heat from previous operations than in the figure. The operators held a speed of about 300 rpm for 20 min. As the speed was raised to 1500 rpm, shaft eccentricity and bearing vibration increased so much that the operator reduced the speed to 700 rpm. Turbine speed was again increased to 1200 rpm but the eccentricity and vibration still remained excessive, so the speed was reduced to 500 rpm and held there until temperature equalization had reduced the eccentricity to about 5 mills. Then the operator again increased the speed to about 1400 rpm. Eccentricity and vibration began to increase rapidly so he reduced the speed, holding it at 1300 rpm until the vibration and eccentricity both dropped. The machine was brought to synchronous speed, connected to the line and loaded in the usual manner.

If the machine had been brought up to speed under initial conditions, unnecessary wear on packing, bearings, etc, would have occurred, resulting in decreased machine efficiency. Instrument indications showed the machine conditions and gave the operator necessary time for working out excessive eccentricity and vibration. During both of these starting sequences the interference detector gave the operator a highly amplified listening-rod signal.

Advance Warning of Trouble

In addition to providing information essential to the operation of a turbine for minimum wear and strain, the turbine supervisory instruments will in many cases give warning of the development of mechanical trouble. Of considerable interest are the cases in which unnecessary expense and serious damage to the turbine generator, because of mechanical failure of some sort, have been avoided by heeding the warning given by the turbine supervisory-instrument record.

The authors concluded that as more experience is acquired the importance of these instruments for proper turbine operation will become increasingly evident. Approximately 80% of the large turbines now manufactured by the authors' company are being equipped with one or more of these instruments. The instruments recommended depend upon turbine characteristics, power-plant arrangement, etc. By careful observation of the turbine supervisory-instrument records during starting and operating periods, either on the spot or by review at a later date, much valuable information concerning the true performance and operation may be obtained. From intelligent use of such information the maximum life and efficiency of the power generating equipment may be realized.



Record of starting sequence of an 80,000-kw steam turbine under normal conditions

Specific Speed Affects Centrifugal-Pump Performance

▶ SPECIFIC SPEED of a centrifugal pump impeller can be defined as the speed in rpm at which a geometrically similar impeller would run if it were of a size to discharge 1 gpm against 1 ft head. A J Stepanoff examined the performance of centrifugal pump as a function of this characteristic. Double-suction single-stage pumps were considered in this study because they cover a wide range of specific speeds and their design is standardized to a high degree for the whole industry.

Mr Stepanoff gave efficiency, horsepower and head-capacity curves for seven pumps ranging in specific speed from 900 to 9200. The figure shows the curves for three of these pumps. Curves No. 1 are for the 900-specific-speed, double-suction pump, and are characteristic of low-specific-speed pumps. The efficiency curve is comparatively flat. Between 60 and 130% of rated capacity, the pump has an efficiency of 90% or better of its maximum. Power input to the pump drops off with increased head until at shutoff it amounts to only 32% of that at 100% capacity. Also, the head at shutoff rises very little above that at rated capacity.

Medium Specific Speed

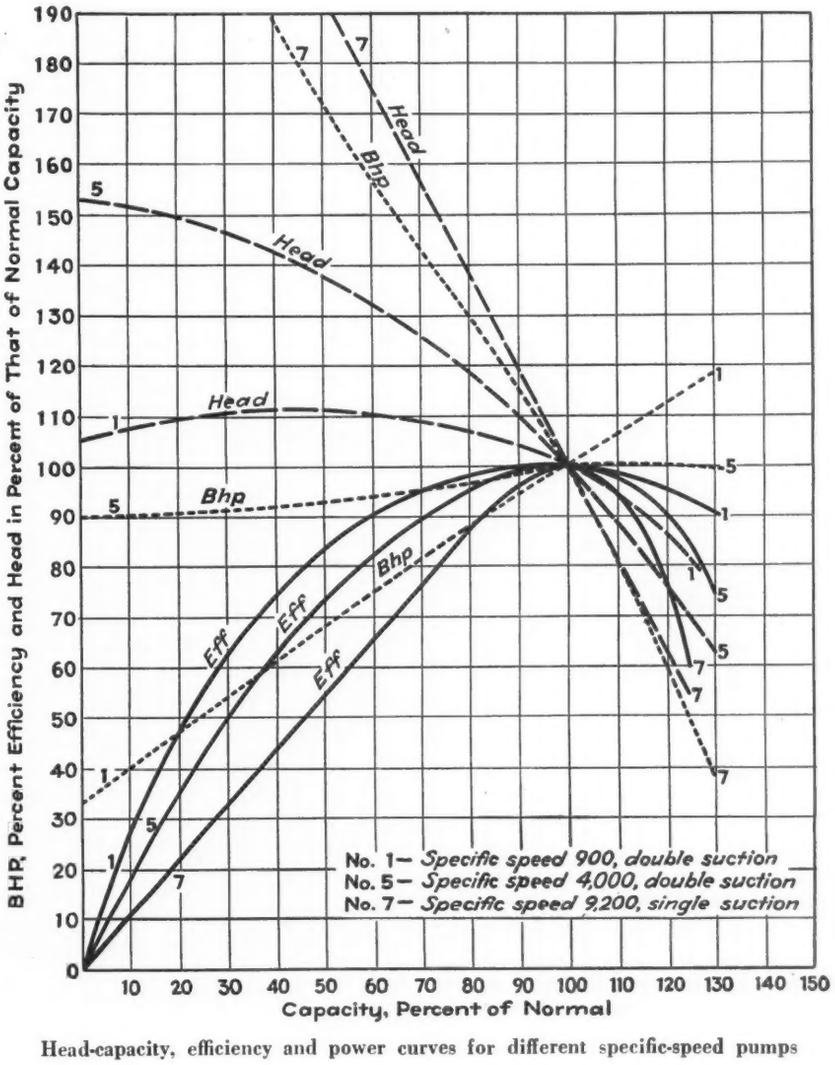
Curves No. 5 are those for a 4000-specified-speed, double-suction pump. Here the curves approach those of high-specific-speed pumps. Efficiency drops off more sharply from maximum, 90% of maximum being obtained between 70 and 120% of rated capacity; horsepower input remains practically constant down to shutoff where it is 90% of that at rated capacity; and the head-capacity curve rises to 152% of normal at shutoff.

Curves No. 7 are for a single-stage single-suction pump with a specific speed of 9200, more than ten times that of the low-specific-speed pump. On this pump, efficiency rises in almost a straight line from zero to maximum and falls off sharply again, so that 90% or better of maximum efficiency obtains only between 82.5 and 112.5% of rated capacity. Head and power rise so fast when capacity falls below normal that the pump cannot be operated against a closed discharge. These curves show typical performance of centrifugal pumps for the specific-speed range covered.

Only slight variations from average curves for a given specific speed are possible without appreciable sacrifice in efficiency. Head-capacity, efficiency and horsepower curves are so interrelated that change in form of one will be followed by a change in the others. Since the theoretical head-capacity curve is a straight line, irrespective of the specific speed, Mr Stepanoff said that the variation in head-capacity-, efficiency- and horsepower-curve form with specific speed was caused by the losses in the pump.

These were classified as leakage, disk friction and mechanical. Leakage loss in a centrifugal pump can occur between the casing and the impeller at the impeller eye, between two adjacent stages in multistage pumps, at the stuffing box, through axial-thrust balancing devices of multistage or single-stage pumps, at bleedoff from the stuffing box through a close-fitting bushing to reduce pressure on the packed stuffing box, and between impeller vanes and casing in open-impeller pumps. Water used for bearing and stuffing-box cooling may also be lost by leakage.

Disk friction loss is that caused by the friction of the liquid on the impeller disk or disks, and the mechanical losses are those that occur in the pump bearings and stuffing boxes.


BHP, Percent Efficiency and Head in Percent of That of Normal Capacity
Capacity, Percent of Normal
Head
Bhp
Eff
No. 1— Specific speed 900, double suction
No. 5— Specific speed 4,000, double suction
No. 7— Specific speed 9,200, single suction

Head-capacity, efficiency and power curves for different specific-speed pumps

Utilities Debate Fixing Turbine Bleed Pressures

Panel discusses of pro's and con's of establishing more-or-less standard extraction pressures for regenerative feed-heating cycle to save time in turbine construction

▶A GROUP OF UTILITY engineers, consultants, turbine and boiler manufacturers recommended that the A S M E give further serious consideration to standardizing extraction point locations for common turbine sizes between 10,000-80,000 kw.

As far back as 1938, the then National Defense Power Committee issued a table of preferred standards for turbines and generators which fixed, among other items, the number and location of extraction points. However, a check of recent installations indicates only about 12% of turbine orders have conformed to these standards, another 20% are close and the remaining 68% must be classed as special.

Proposal Summarized

To summarize the proposal, it is planned that a committee revise and possibly extend the present table of preferred standards in light of the best of modern experience so that minor variations in extraction pressures will not require turbine manufacturers to alter standard casings solely to accommodate extraction openings. It was carefully and repeatedly explained that such standardization would not be allowed to stand in the way of real progress toward better plant efficiencies or improved plant layout.

In return for a somewhat greater degree of standardization, the manufacturers point out the possibility of shortening the period between turbine order and delivery. Experience indicates a period of 20-40 days average after placing of turbine orders before heat-balance details are ironed out. Manufacture of many duplicate ship-propulsion units has already shown that much can be done to shorten time and reduce costs of producing turbines.

Boiler manufacturers indicate that final feedwater temperatures at full load and at all other load points are of paramount importance in furnace and superheater design as well as a controlling influence on the size of economizer and air preheater. However, the proposed standardization would probably include a sufficient number of extraction points to give the highest economical feed temperature; need for blanking these openings in the casing would arise from some other controlling plant condition rather than from standardization of the turbine casing.

Standards Followed

Some consultants report close adherence to the present table of preferred standards except when purchasing duplicates of previously installed units. Since the present standards tend toward lower final feedwater temperatures, this position is justified by savings in boiler-feed pumps, pipe and even boiler drum size.

Other engineers, faced with high fuel costs or special conditions, believe that refinements in the feedwater cycle will be often justified economically and that such cases should continue to demand the necessary special turbine construction. Certain systems have standardized on extraction pressures simply for convenience in physical layout of equal size heaters.

Turbine Users Agree

Practically all users of turbines agree that evaporator systems and deaeration can be accomplished satisfactorily with any standard arrangement of extraction pressures. Another point of near unanimity is that, given a final feedwater temperature and number of stage heaters, the exact bleed pressures selected have little effect on heat rate.

Turbine makers reemphasize that suggested standards do not apply to special backpressure and extraction machines which are inevitably of special construction. Rather, they indicate, real progress would come from simply limiting variations resulting from the fact that different groups of engineers do the same things with slight and often unimportant variations when not influenced by any central group seeking some degree of uniformity.

Interchange of Ideas

Further, many outstanding and desirable ideas in connection with feedwater cycles have not yet become generally known. Study by an organized group will permit an interchange of these ideas with resulting better feedwater cycles than those now in actual use.

It was pointed out that reliability and freedom from maintenance is now of great importance as well as efficiency so that any additional heat-recovery apparatus must show a considerable economic gain to offset potential loss of capacity. Further, provision should be made for existing station extensions in which present operating steam pressure dictates at least one heater pressure.

The group were reminded that the present table of preferred standards was adopted with the proviso that constructive comment would be welcomed. In a similar manner, any further standardization efforts should provide for some means of incorporating such real progress in the regenerative cycle arrangement as had been proven in practice. Suggested preferred standards for those who are not intending to deviate greatly from best current practice should result in gains to both manufacturer and user.

Concrete Proposal

To start with one concrete proposal, it has been suggested that a group of engineers and operators settle on a definite group of extraction stages for each of the various frame sizes that the manufacturers normally call their standard machines. Specific stage numbers, starting from the exhaust end of the machines, have been proposed rather than specific pressures.

No attempt has yet been made to correlate extraction pressures of the several turbine manufacturers but the opinion has been expressed that all types of turbines have sufficient flexibility so that any manufacturer, within a reasonable degree of variation, could meet any combination that might be set up as desirable.

At the motion of one member, the matter of setting up a committee of users, engineers and manufacturers' representtives has been referred to President and Council of American Society of Mechanical Engineers. Such procedure, including most careful review of the many important differences in regenerative-cycle layout, will be essential to avoidance of requirements that must inevitably handicap development of higher efficiencies for new central stations and result in dislocation where new units are added to existing installations. Some considerable time must elapse before recommendations of committee can be put into effect.

Scales Still Plague Boiler Operators

▶ WHILE MANY PROBLEMS of scale, carryover and turbine-blade deposits still have no simple direct answers, an ASME audience was reminded that cleaning procedure for boilers has been reduced over a period of years from mechanical methods requiring frequent outage to one of preventive chemical water conditioning and continuous blowdown with only annual or infrequent removal of accumulated sludge. With this introduction, discussion turned to the current problem of silica scales.

Scale forms in a boiler when a steam bubble grows from a heated metal surface, becoming slightly superheated in the process, and leaving behind solid matter that has no other place to go. Calcium sulphate and carbonate scales grow in this manner from needle-like crystals that form a strong structure. Further study of crystal structure of various common scales will help lead to proper corrective methods. Certain materials "hang together" better than others and so form harder and more dense scales.

Silicate Scales

Silicate scales tend to build up in dry drums and above drum water-level, probably forming as sodium silicate first which is then dehydrated to insoluble silica. How these scales form must be studied before a corrective can be applied.

No fixed limit can be set for the amount of silica that can be tolerated in boiler water. One case, in which makeup contained 25 ppm silica, had no boiler troubles until zeolite treatment was supplemented with a hydrogen-zeolite exchanger even with drum concentrations of 750 ppm silica. Adding the hydrogen-exchange unit reduced alkalinity; scale formed in the boiler and burned tubes resulted. Freedom from scale was obtained after alkalinity was increased by changing flow through the zeolite unit until the ratio of alkalinity to silica was brought over one-to-one. Equipment is available, it was reported, that could, in extreme cases, reduce chlorides in makeup water to 2 ppm, produce any desired alkalinity, and reduce silica to 2-3 ppm.

One authority noted that gases such as hydrogen sulphide, carbon dioxide, ammonia and oxygen could not be neglected in the study of silica scale because of their effect on the character of the deposit. These gases might even contribute to certain cases of blade failure in turbines.

Turning to the problem of carryover, several theories were reviewed, none of which completely explains observed facts. According to the mechanical theory, the proportions of solids in steam would be in the same ratio as in the boiler water. Some hold that salts evaporate in proportion to their vapor pressures, which does not explain carryover phenomena too well, as some of the materials carried over evaporate only at very high temperatures.

Experiments now under way indicate that common table salt can be partly dissolved in superheated steam. These tests indicate that high-pressure steam has some of the properties of a liquid. Another theory holds that sodium hydroxide carries over as a liquid through the superheater and can carry other solids with it. Another theory imagines actual melting of some of the solids below present top steam temperatures. None of these theories is entirely satisfactory.

One expert obseved that neither the amount of carryover nor the amount of solids was of major importance since many pounds of solid material would be passed through the turbine even under best conditions. Only those that stick in piping and on turbine blades need be reckoned with. Different solids have been observed as deposits in different temperature ranges within the turbine. In fact, solid deposits have been removed from a backpressure turbine by opening the governor bypass valve to increase exhaust temperature from 450 to 600 F. This technique has been developed as a preventive measure and the turbine is now operated at increased temperature 15 min. every 8 hr to eliminate formation of deposit. Deposits are simply redissolved in the steam.

Turbine-blade deposits have been observed in two distinct forms. At high temperatures, deposit usually is found as silvery gray crystals that occur in the 600-300-F range of the turbine. A glassy quartz is often found below the 300-F range on low-pressure blades. The former sometimes appears alone but more often combined with sodium oxide. It can build up to a scale of ¾ inch or more. The crystal form can be identified by its sparkle and is often found on shroud bands and other parts out of the main flow stream as well as on the blades themselves.

The crystal form is not found below about 300 F. The glassy deposits occurring below that temperature do not contain sodium oxide but do show some iron oxide and sometimes traces of organic matter, probably from oil. These deposits cling to the convex surface of the blade directly in the flow path.

Prevention

Some operators avoid scale and turbine blade deposit troubles by using only evaporated makeup and watching condenser leakage with extreme care. This applies, of course, only to central stations where low makeup percentage is the rule. Some employ no chemical treatment of boiler water at all, allowing boiler water alkalinity to seek its own level.

In summarizing, one expert commented that chemists begin to have trouble answering when the questions get specific. For instance, no one can answer categorically how much silica can be tolerated in a boiler water without knowing surrounding chemical and physical conditions. At present, as regards the silica problem at least, each of many investigators has hold of one phase of the problem as it affects one or a few plants with which he has experience. For the future, integrated experience of many observers that can note variations of one factor at a time will be essential before treatment can be applied on other than a quasi-empirical basis.

PANEL OF WATER EXPERTS

C H Fellows (chairman), Detroit Edison Co; T E Purcell and S F Whirl, Duquesne Light Co; B O Buckland, General Electric Co; S T Powell, Consultant; E Mandel, Commonwealth Edison Co; O F Campbell, Sinclair Refining Co; H C Miller, Public Service Electric and Gas Co; C B Campbell, Westinghouse Electric & Mfg Co; W C Schroeder, U. S. Bureau of Mines; W E Caldwell, Consolidated Edison Co; S E Tray, Allis-Chalmers Mfg Co; E P Partridge, Hall Laboratories

Developments in Diesel Ships

Modern Maritime Commission vessels are powered by direct-drive and geared diesels with electric or hydraulic couplings*

▶ SINGLE-SCREW direct-drive ships require low-speed opposed-piston engines that can operate at propeller speeds below 100 rpm. Diesels for this purpose fire heavy oil with preheat to 160-180 F. Usually the lower piston bears on the center throw of a 3-arm crankshaft while the upper piston connects to the other two cranks by side rods. Some tankers of this design have waste-heat boilers that generate sufficient steam for auxiliary power.

Many of the new vessels, however, are powered by oil engines running above 200 rpm, connected to the low-speed propeller shaft by gears and either electric or hydraulic couplings. Excellent operating records have already been turned in by ships of this design. In the standard arrangement, two engines, side-by-side, drive a single propeller shaft through two pinions meshing into a single bull gear.

This arrangement permits two (or even four) engines to supply power to one shaft. Any engine can be quickly disconnected from the common gear by throwing a lever in the case of an electric coupling or opening remote-operated oil valves on the hydraulic type. Since no metal-to-metal contact exists between engine crankshaft and gear pinion in either coupling, all torsional vibration originating in the engine smooths out before reaching the gear teeth. Thus gears may be designed for stresses no greater than would be the case with steam-turbine drive.

The principal function, however, of the coupling arrangement is to utilize the smaller and more efficient high-speed diesel unit on slow-speed shaft drive. In addition, the couplings can transmit only a limited amount of shock torque, that is, they will "pull out" in event of major trouble that stops either engine or propeller.

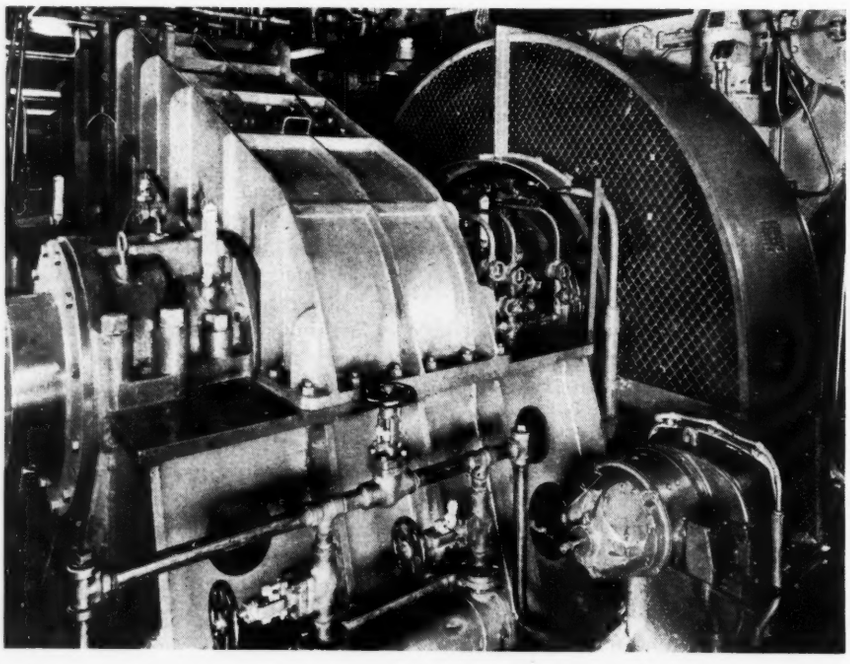
For maneuvering, the two-engine assembly with couplings of either type allows running one engine forward and the other astern. Propeller direction can be reversed almost instantly at the turn of a lever.

In the electric coupling, two rotating elements are separated by an air gap much in the same manner as an induction motor. The outer fabricated spider with a heavy steel rim supports field poles bolted to the inner surface and supplied with direct current through sliprings. The inner element, of laminated construction, carries double-squirrel-cage conductor bars embedded in the iron. Rotation of the direct-current field poles sets up eddy currents in the squirrel-cage windings causing transmission of torque.

Usually the inner element, having smaller flywheel effect, is connected to the engine shaft and the heavier outer unit fastened to the pinion. In some instances, however, the outer unit has been attached to the engine for additional flywheel effect.

The electric coupling depends on slip between the two elements for generating torque current in the squirrel-cage windings. Slip ranges from one to two percent.

Fig. 1—Westinghouse electric coupling that transmits torque from engine to gear pinion can be instantly declutched for maneuvering or engine maintenance



Hydraulic Couplings

Hydraulic couplings are well known as variable-speed drives for power plant fans and pumps or as "fluid drive" for automobiles. Their use at sea, however, antedated either of these common applications.

In the hydraulic coupling, two identical half-doughnut shaped rotating elements are built up with radial vanes to act, one as a pump, the other as a hydraulic turbine. When both halves are filled with oil, a continuous circuit is established which effectively transmits torque. With less and less oil in the circuit, less power is transmitted, and when the oil is emptied completely, the separate halves can each turn free of the other.

Auxiliary diesel-generating sets on shipboard should be held to 30-in. water gage backpressure and 10-in. water gage suction for best results. For these, the engine manufacturer can design fresh-water cooling pumps because he knows the jacket drop and heat-exchanger characteristics but the salt-water cooling pump should be designed for separate motor drive.

Governing marine diesels requires regulating load by means of speed variation. When connected to a propeller directly or through gears, load change on an engine is inherently accompanied by speed change. These load changes are not instantaneous and response of governor can be made as rapidly as conditions require.

---

* From a symposium on marine power, annual meeting of ASME and Society of Naval Architects and Marine Engineers, Dec. 3, 1942, by H G McConechy, Sun Shipbuilding and Dry Dock Co, B V E Nordberg, Nordberg Mfg Co, H C Coleman, Westinghouse Electric and Mfg Co, R G Olson, American Blower Corp, Ralph Boyer, Cooper-Bessemer Corp, and H W Thorell, Woodward Governor Co.

With Speed, Space and Production the cry—

Let the Modern UNITROL

REG. U.S. PAT. OFF.

method of housing and *centralizing* Motor Control help solve vital production problems

Unitrol, a simpler, better way of housing Motor Control whether inside a machine, beside a machine, or in a centralized group . . . eliminates many of the operations, interruptions, and obstacles that stand between America and the production it must have.

If you are manufacturing important motorized machines with built-in control, Unitrol speeds up that process by eliminating any need for inside mounting bases, by eliminating many other machining, wiring and assembling operations.

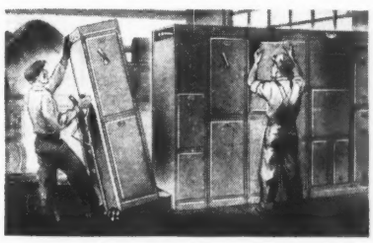
If you have installed or are going to install Motor Control near a group of machines, Unitrol packs Motor Control into a much smaller space, enables you to move Motor Control out of the way, to utilize space otherwise wasted. It eliminates any need for special floor or wall preparation, saves many vital man-hours, conserves vital space.

If you are centralizing Motor Control for an entire plant, Unitrol enables you to do it better, faster, easier, far more economically . . . It enables you to get more than double the amount of control in the same space . . . It enables you to *adapt* your control to the space you have without further preparation or building expense. It expands and contracts easily, to follow your changing requirements.

No man concerned with the mounting, installation, use or maintenance of Motor Control; no man concerned with motorized machine production, can afford to overlook Unitrol. The whole story is told in the book "Unitrol . . . the next step forward in Motor Control progress." It's free for the asking. But write *today*—now—for your copy. CUTLER-HAMMER, Inc., 1358 St. Paul Avenue, Milwaukee, Wis. *Associate:* Canadian Cutler-Hammer, Ltd., Toronto.

← The individual Unitrol mounting frame is *better* for machines with built-in Motor Control. It eliminates many machining, wiring and assembling operations.

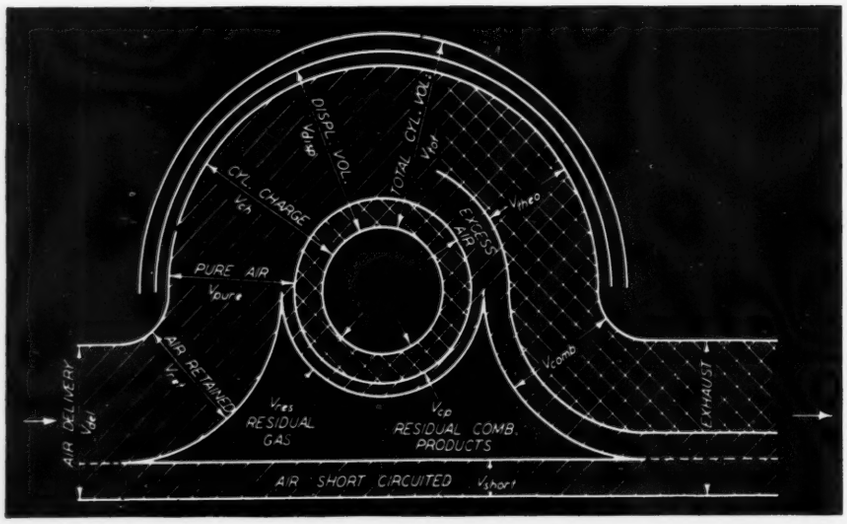
→ The individual Unitrol *Section* houses Motor Control for several motors or motorized machines, is compact, space-saving, convenient and economical. No supports, no other structures or preparation necessary.



The complete Unitrol Control Center houses all the control and control equipment in the plant, for easy, speedy man-power-saving installation, maintenance, change, expansion or curtailment. No wall or floor preparation. No racks, trellises or frames. Permits installation of more than double as much control in same space.

CUTLER-HAMMER
UNITROL
C-H

Copyright 1942—Cutler-Hammer, Inc.



Charging process of an internal-combustion engine—either 2-cycle or 4-cycle with considerable valve overlap. In a 4-cycle engine without valve overlap, the air short-circuited is zero and the area below the dash line is missing

Supercharging Requires New Diesel Definitions

▶ THAT ADVENT OF SUPERCHARGING creates a need for new methods of rating and defining performance was made evident in several papers presented at the Oil and Gas Power session. For the purpose of establishing a method by which the rating of supercharged engines may be calculated, Ralph Miller, Worthington Pump and Machinery Corp, analyzed temperature conditions of non-supercharged and supercharged diesel engines.

With few exceptions, engines being supercharged at present were designed to operate as naturally aspirated engines and their horsepower ratings have been established by long field experience. This rating is limited by three factors: combustion efficiency, loads imposed by gas pressure, and the mean temperature of the cycle. If an engine has been so designed that all factors have the same margin for safe operation at full load it follows that when the unit is supercharged, the mean temperature and maximum combustion pressure of the standard engine must not be exceeded.

With the passing of the method of establishing the rated load by the appearance of the exhaust, brake mean effective pressures have been increased to values which have been established by tests and actual field experience for each particular type and size of engine in its particular service. By this trial and error method, the engine is rated at the maximum mean temperature it will stand with the chosen margin of safety required for the service. However, the actual value of the mean temperature is not found by this method.

While it may be of some value to know the mean temperature of the cycle of a given engine, the information is of slight use as a means of rating projected designs because engines of different speeds, size, and design features, such as oil-cooled pistons, would not be rated at the same mean temperature. However, when the output of a given engine is increased by supercharging, the effective or useful increase in horsepower above the established ratings as a non-supercharged engine can be evaluated only by calculating the mean temperature of the cycle.

On the assumption that the maximum combustion pressure remains constant at the value of the pressure used in the non-supercharged engine, Mr Miller analyzed the non-supercharged and supercharged conditions, developing a working procedure for determining the mean temperature of the cycle.

From the analysis, Mr Miller concluded that supercharged engines should be rated in accordance with pressures and mean temperatures as determined by design and established practice. Increases in engine capacity obtained by oil-cooling the pistons, increasing maximum combustion pressure or permitting the mean temperature to exceed established limits should not be credited to supercharging, because similar improvements or increases in temperatures and stresses may be applied to a non-supercharged engine, thus increasing its normal rating the same amount.

Cooling Manifold Air

When supercharged engines are rated at pressures and mean temperatures equal to the naturally aspirated engine, the orthodox system in which the manifold temperature is increased by the temperature rise through the blower shows a maximum possible increase over the standard engine mean indicated pressure of about 34.5% at the optimum pressure of 5 psi. This will give an increase of about 42% on the brake mean effective pressure. With manifold air cooled to atmospheric temperatures the indicated horsepower may be raised to 187% with 7 psi pressure and 70% increase in brake horsepower results at 4 psi pressure. Without air cooling, 4 psi permits a 40% increase and thus, for every horsepower gained by supercharging, 0.75 hp may be added by cooling the manifold air to 90 F.

In the land-transportation field, air cooling to atmospheric temperature is impractical. However, if air is cooled in this case to 20 F above atmospheric temperature, the rating increases from 140 to 158% of the non-supercharged rating, at 4 psi pressure. In this example, a locomotive engine rated 700 hp non-supercharged would be rated 980 hp when supercharged without air cooling but 1110 hp with air cooled to 20 F above atmospheric temperature.

In another paper, P H Schweitzer, Pennsylvania State College, pointed out that the conventional definition of volumetric efficiency for internal-combustion engines is unsatisfactory for incompletely scavenged engines. As usually defined, volumetric efficiency is the ratio of the amount of fresh air retained in the cylinder to the displacement volume. Because diesel engines operate with considerable excess air the gas remaining in the cylinder after scavenging includes some air which participates in the combustion and thus influences the power output. A satisfactory definition of volumetric efficiency would indicate the charge in the cylinder rather than the air in the charge. Prof Schweitzer proposed that volumetric efficiency be defined as the air retained plus the residual gas remaining in the cylinder after scavenging, divided by the displacement volume.

YARWAY IMPULSE TRAPS *At Hartford Electric*

Draining 250 lb. Steam Lines and Storage Tank Heaters . . . Yarway Traps Fill the Bill at Hartford.

Yarway Impulse Traps are replacing less efficient, less dependable devices on important equipment in many plants. More than 180,000 Yarway Impulse Traps have already been sold and present sales are at an all-time high.

Why? Because the Yarway is the one trap that offers all the following features; *High efficiency*—with continuous discharge on heavy condensate loads, and intermittent discharge on light loads. *Good for all pressures* within wide range without change of valve or seat. *Simple design*—easy to maintain. *Small Size, Light Weight, Straight Through Piping*—facilitating installation, saving space. *Low Price*—often making it cheaper to install a new Yarway than to repair an ordinary trap.

End your steam trap troubles with Yarway. Ask your dealer or write for Catalog T-1737.

YARNALL-WARING CO., 100 Mermaid Ave., Philadelphia

To insure maximum efficiency of Yarway Impulse Traps, inspect them regularly, cleaning traps and strainers when necessary. The ready accessibility of working parts in the Yarway trap makes this a quick and easy routine operation.

YARWAY IMPULSE STEAM TRAP

Continuous-Cleaning Grate Extends Spreader Applications

▶ ABILITY TO BURN an unusually wide range of fuels with high plant economy and outstanding reliability form sound reasons for the rapid growth of spreader-stoker firing, according to a paper by R. L. Beers, vice-president in charge of engineering, Detroit Stoker Co, in which the author outlined the history of this method of firing and described recent design developments.

Early natural-draft spreaders were generally unsatisfactory but development of forced-draft types produced fuel-burning units which could operate at high rates, handle inferior grades of coal with low-fusion ash, react sensitively to load changes, and burn small sizes as satisfactorily as large. A protective layer of ash kept grate temperatures low and thus cut maintenance.

Basic Improvements

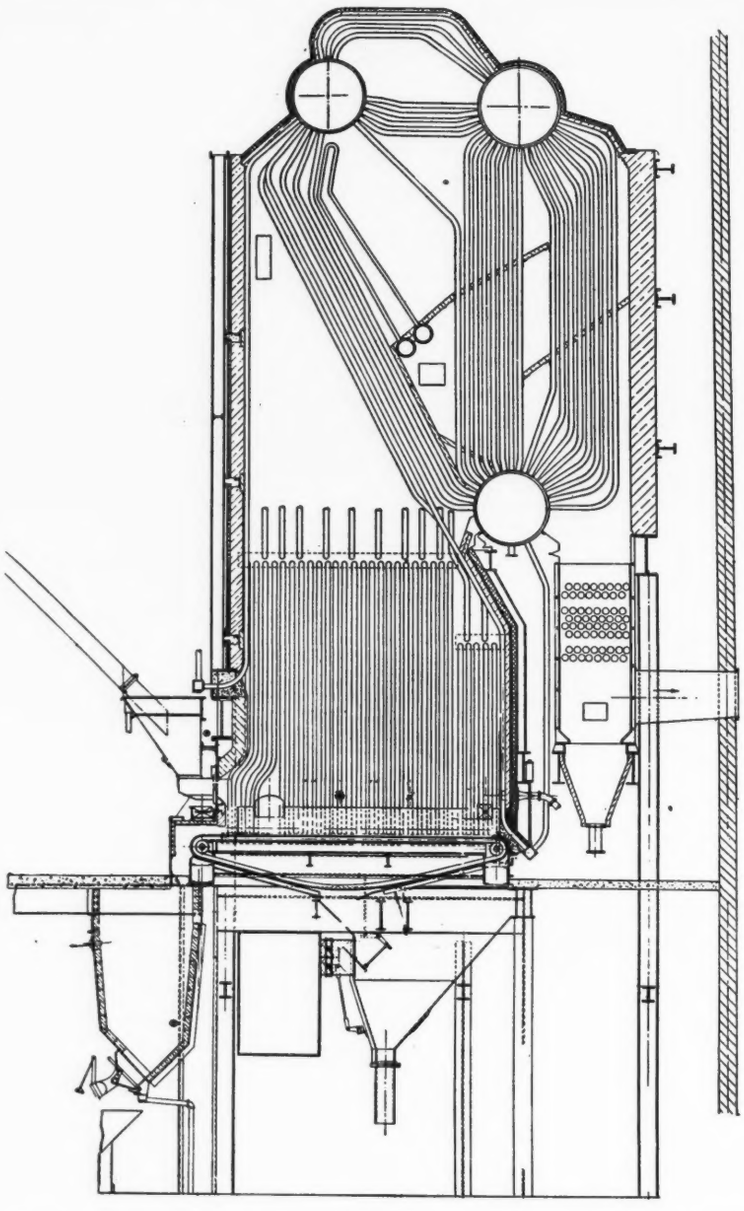
First forced-draft spreaders used hand-cleaned stationary grates with undivided air chambers and were equipped with start-stop automatic control. For improved results, over-running coal feeders were developed to give uniform distribution and to handle long grates. These feeders could be connected to a floating type of automatic regulating system. Power-operated dumping grates permitted more rapid cleaning. Dividing the air chamber to provide a separate chamber for each feeder and grate section allowed cleaning one section, with coal and air supply shut off, without interfering with other sections.

For larger boilers and higher burning rates, overfire-air jets increased furnace turbulence with considerable success. Flyash from spreader units is comparatively coarse, fairly easy to separate and contains sufficient carbon to justify reburning. For natural-draft plants low-draft-loss cinder traps give satisfactory separation. With induced-draft fans, cyclone collectors or cinder-separating fans prove effective.

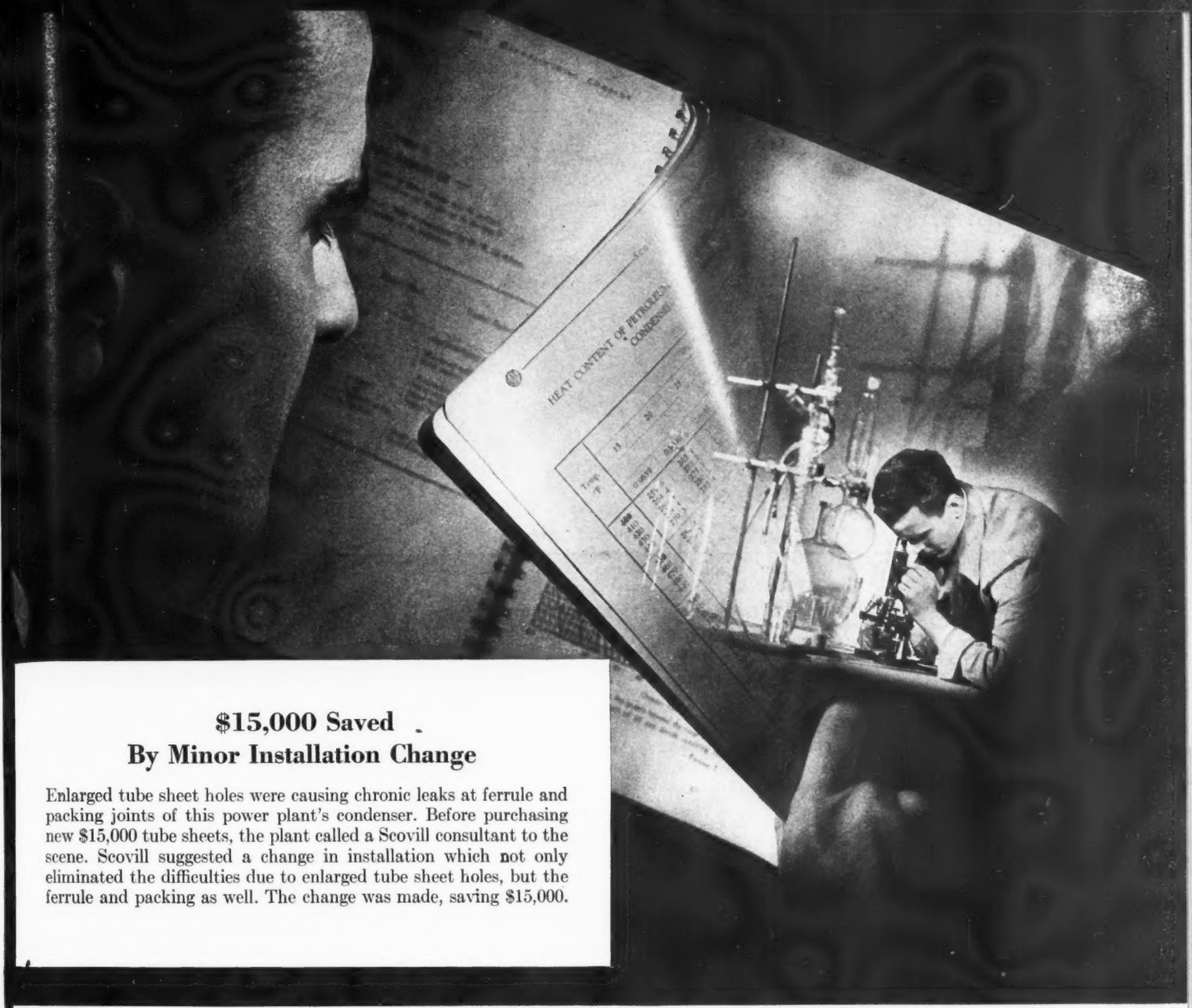
Trial installations prove that flyash burns readily when injected into the furnace. Steam jets proved costly and caused more or less trouble in operation. A system was developed for continuously conveying flyash recovered from boiler soot hoppers and cinder traps back to the furnace by means of a small high-pressure fan.

Although spreader stokers with power-operated dumping grates were applied to boilers rated at 100,000 lb per hr with satisfactory results, it was felt desirable to eliminate the interruption in furnace conditions which occurs during cleaning periods. This led to development of a continuous-cleaning grate of special traveling design with overlapping non-shifting joints. The grate travels forward at low speed, discharging ash at the front of the boiler. Slow grate travel, a fraction of an inch per minute, allows ample ash insulation so that grates are at low temperature.

The drawing shows a continuous-cleaning-grate installation on which loads up to 225,000 lb per hr have been carried. Burning Indiana coal averaging about 10,500 Btu per lb, this unit registered efficiencies of about 83% with a burning rate of approximately 65 lb per sq ft of grate area. This stoker has burned more than 90,000 tons of coal without any grate replacement to date and the grates show no signs of growth.



This continuous-cleaning-grate spreader stoker fires a 210,000-lb-per-hr boiler



$15,000 Saved
By Minor Installation Change

Enlarged tube sheet holes were causing chronic leaks at ferrule and packing joints of this power plant's condenser. Before purchasing new $15,000 tube sheets, the plant called a Scovill consultant to the scene. Scovill suggested a change in installation which not only eliminated the difficulties due to enlarged tube sheet holes, but the ferrule and packing as well. The change was made, saving $15,000.

Use the laboratory behind the page

. . . To Make Scarce Metals Serve You Better and Longer

"At 210° F., recommend 70-30 Cupro-Nickel" . . . said Scovill's laboratory technicians, solving a complicated heat exchanger problem for a Scovill customer. You too may find that Scovill's laboratories can help you find the right tube for the job, or make the tubes you have stay on the job longer.

Scovill's new Heat Exchanger Tube Manual well illustrates the wide scope of Scovill's Service to Condenser Tube users. When any special problem in metal arises, whether it be the selection of materials to resist corrosion . . . or an expert analysis of your conditions of heat transfer or fluid flow . . . use *the laboratory behind the page* for time-and-money-saving results.

The new edition of the "Manual" includes charts, formulae, specifications and technical discussions — all on subjects of interest to those engineers and associates who are constantly needing unusual practical data to help them solve their heat exchanger and condenser tube problems.

Another publication — "Scovill Condenser Tubes" — is available to others whose heat exchanger tube problems are concerned with the more common problems of corrosion, material selection and methods of installation.

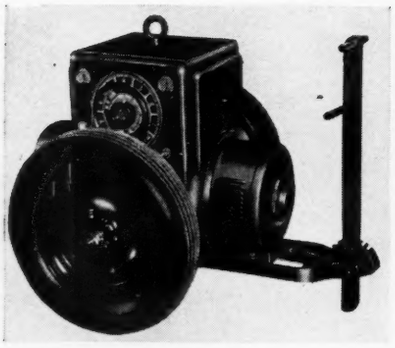
And yet these two publications represent only one of Scovill's three services for power, marine, and refinery engineers. Scovill's service in Manuals is supplemented by Scovill's field service in men, and Scovill's laboratory service in metals. Write to Scovill Manufacturing Co., 13 Mill Street, Waterbury, Connecticut.

SCOVILL
Masters of Metal

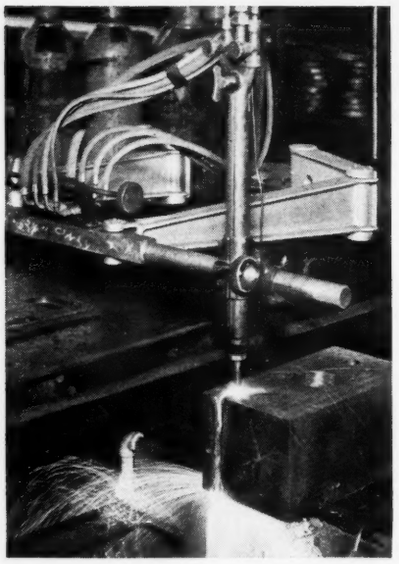
Scovill Condenser Tubes

ONE PRODUCT...THREE SERVICES

- **SERVICE IN MEN**
- **SERVICE IN METALS**
- **SERVICE IN MANUALS**

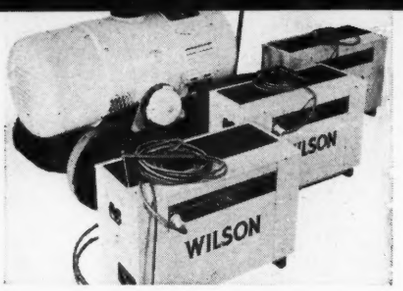


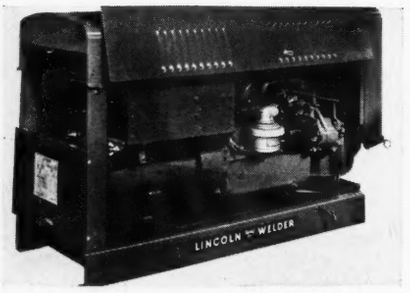
1



2

3





4

ing volts and amperes. Maker claims that this feature provides many possible combinations of voltage and current because both voltage and current control are continuous in operation. *Lincoln Electric Co, 12818 Coit Road, Cleveland, Ohio.*

7 AIR-COOLED ARC WELDER—Heavy-duty air-cooled arc welder, known as the 250 F, contains built-in cooling system which reduces thermal stress that strains insulation on ordinary machines and shortens life. Capable of handling electrode from 1/16 to 3/16 in., the new model has 24 heat steps, input voltage of 230, and current range of from 15 to 250 amp. Machine operates on 60-cycle frequency, and on a single phase or one phase of a 2- or 3-phase system. *Ergolyte Mfg Co, Philadelphia, Pa.*

8 DC WELDER — Flexarc portable welder rated at 200, 300 or 400 amp for 220, 440 and 550 volts ac circuit. Current adjustment obtained by bell crank, making it possible to preset desired current before welding. Steady current, regardless of arc length, is provided by arc control which can be adjusted to suit welding job. *Westinghouse Electric & Mfg Co, East Pittsburgh, Pa.*

(Photos 7 and 8 on page 94)

1 WELDING TRAILER — Two-wheeled lightweight, pneumatic-tired trailer for mounting 200-, 300- and 400-amp Hobart electric drive welders announced. Trailer designed so that mounting the welder is accomplished easily by means of three bolts in trailer frame which register with three holes in legs of welding machine. Unit is easily moved by hand because of its low, underslung construction, narrow tread, and precision method of balancing. *Hobart Bros Co, Troy, Ohio.*

2 CUTTING TIPS — Airco "45" high-speed machine cutting tip has a nozzle with divergent exit portion, making it possible to eject a narrow, high-velocity stream of oxygen practically free of exit turbulence that burns a narrow path to the metal than the conventional cutting tip. As a result of burning away less width of metal in a cut, unit cuts with no increase in oxygen consumption. As the oxygen stream penetrates steel, its velocity is constantly dissipated. Tip fits standard machine cutting torches. *Air Reduction, 60 East 42nd St, New York, N. Y.*

3 ARC-CONTROL STATION — Arc-control stations said to result in greater welding output per machine, better control by the operator, and improved welds on thin-gage metal. Arc-control stations are made in capacities of 75 and 150 amp. They are auxiliary devices, connected in series with the welding circuit of any constant potential arc welding generator. Illustration shows three Honey Bee arc-control stations attached to a Wilson Hornet welder. *Wilson Welder & Metals Co, New York, N. Y.*

4 ENGINE-DRIVEN ARC WELDER — Engine-driven unit is for job welding and embodies a new system of engine-speed control for maximum fuel economy and minimum engine wear. Of 200-amp size (see illustration) this new unit is engineered with a current range of 40 to 250 amp, and can be used for welding light-gage metal, repairing cast iron parts such as engine blocks, fabricating machine parts and structures, and for hard facing worn parts. Welder powered by a Hercules industrial engine equipped with a centrifugal governor. *Lincoln Electric Co, 12818 Coit Rd, Cleveland, Ohio.*

WELDING POSITIONER — Ransome positioner designed to handle loads up to 22½ tons with a center of gravity 12 in. from the table top. The 84-in. square table tilts from 45 deg in one direction to a vertical position in the other. Unit provided with T-slots for readily attaching work to table top. Rotates a full 360 deg in either direction—controlled through remote pushbutton station. *Industrial Div, Ransome Machinery Co, Dunellen, N. J.*

ARC-WELDING ELECTRODE — W-26 electrode fulfills need for vertical and overhead arc-welding electrode that will give a high quality job from the standpoint of physical characteristics, as well as easy operation, adequate penetration, and practically flat fillet contour. Electrode now available in diameters of ⅛ and 5/32 in. Other sizes from 1/16 to ¼ in. expected to be available shortly. *General Electric Co, Schenectady, N. Y.*

WELDERS' SAFETY CLOTHING—To protect welders against painful and dangerous exposures to molten metal sparks, company announces completely new and wide assortment of high-grade welders' safety clothing that will keep hot sparks away from skin and normal work clothes during welding operations. Clothing made from the highest grade chrome-tanned cowhide weighing approximately 5 oz per sq ft. Fire-resisting duck is used for backing and weighs approximately 12 oz per sq yd. *American Optical Co, Southbridge, Mass.*

WELD-SPATTER ELIMINATOR—Acme industrial finish flash-off No. 99 designed to eliminate weld spatter. Mechanic simply brushes, sprays or wipes on material along edges of metal surfaces to be joined by weld. When welding is done metal chips bounce or fall off instead of adhering to areas adjacent to the seam. This elminates grinding or scratching these chips off. *Department FS-24, Acme White Lead and Color Works, Detroit, Mich.*

WELDING ELECTRODE — New electrode designed specifically for all-position welding of mild steel with ac welding machines. Made in the following diameters: 1/16, 3/32, ⅛ and 5/32 in. High quality of deposited metal of No. 530 is fully comparable to that of the best dc reverse polarity all-position electrodes. *Wilson Welder & Metals Co, Inc, 60 East 42nd St, New York, N. Y.*

WELDING ELECTRODE—Arc-welding electrode has been produced expressly for use with "Fleet-Fillet" technique of arc welding, recently announced by the company. Electrode designed to obtain maximum benefit from the new technique in speed welding. Fleetweld 11 is not only a fast-flowing electrode, but it gives deeper penetration of metal into the root of the joint. It is shielded-arc electrode heavily coated to exclude oxides and nitrides. *Lincoln Electric Co, 12818 Coit Rd, Cleveland, Ohio.*

(Continued on page 114)

Triple Threat...

TO SCALE AND CORROSION

SYMBOLIC of this triple threat are the three endless belts shown here, rolling night and day to carry Nalco chemicals on the first lap of their journey to keep thousands of the nation's power plants operating at maximum efficiency.

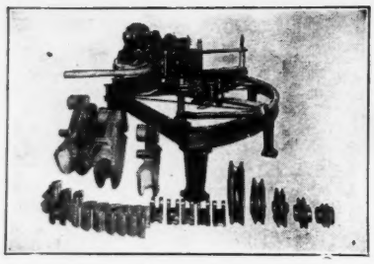
Nalco moves forward against scale and corrosion with three main spearheads of attack: 1. *Field Surveys* by competent engineers who review conditions in your plant; 2. *Laboratory Research* by skilled technicians who analyze your water conditions and formulate the most effective treatment; 3. *Production of Chemicals* to meet your needs by men capable of translating laboratory formulae into carload shipments.

For water treatment to best meet your individual requirements, write today for a Nalco Survey of your plant.

NATIONAL ALUMINATE CORPORATION

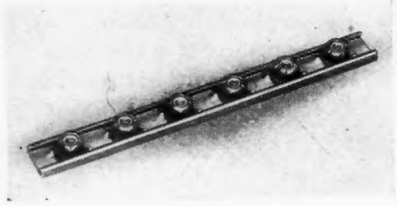
6222 West 66th Place • Chicago, Illinois

Canadian inquiries should be addressed to Aluminate Chemicals, Ltd., 555 Eastern Avenue, Toronto, Ontario

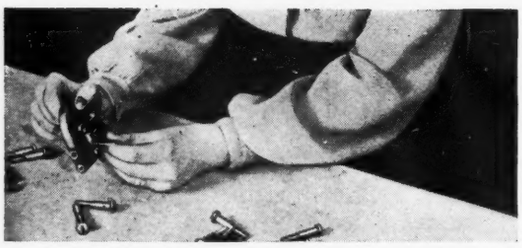


1

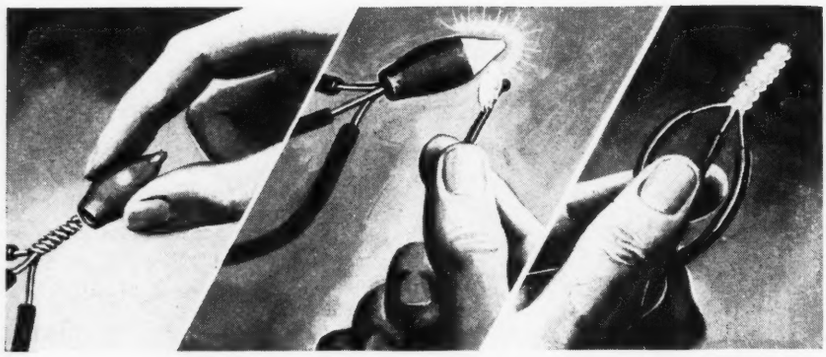
2



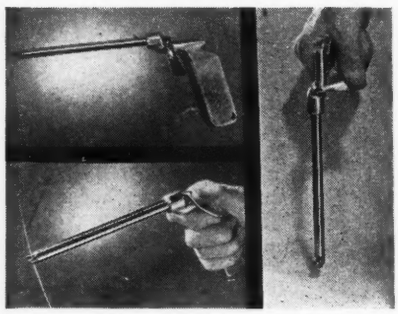
3



4



5



6

WRENCHES AND OTHER TOOLS

1 PIPE BENDER—Tal's Prestal pipe bender will bend, according to the maker, all iron and steel pipe, as well as solid bars of mild steel from ⅜ in. to 2 in. in three minutes or less. Quick-release device enables operator to remove pipe instantly after bending. *Tal's Prestal Pipe Bender, Inc, Milwaukee, Wis.*

2 PNEUMATIC FOOT PEDAL—Schrader pneumatic foot pedal cuts operator's effort in operating pneumatic machines. Where work necessitates standing away from the machine, the pedal can be brought out to allow operation in an erect position. *A Schrader's Son, 470 Vanderbilt Ave, Brooklyn, N. Y.*

3 CHANNEL NUTS—Elastic stop gang channel nuts, widely applied in the aircraft industry, now offered for testing to general industry for application where a multiple, self-locking, bolted fastening is required. Consist of specially designed elastic stop nuts with four lugs at base, installed at specified intervals in a metal channel strip preformed to accommodate the nut lugs under longitudinal flanges. *Elastic Stop Nut Corp, 2332 Vauxhall Rd, Union, N. J.*

4 TOOL STAND—Scherr tool stand primarily for vise or clamp for holding micrometers, snap gages and other tools. Tool stand has been so constructed so that micrometer or snap gage may be held securely without damage to finish. Illustration (left) shows inspector using gage without stand, and the illustration (right) shows the inspector using the tool stand, using both hands for testing the work. *George Scherr Co, Inc, 128 Lafayette St, New York, N. Y.*

5 SOLDERING KIT—Jiggers are small, self-contained soldering units that contain correct amount of 50-50 solder and flux hermetically sealed in a waterproof heat generating outer shell. To obtain soldered electrical connection it is only necessary to push a wire splice into a jigger and touch a lighted match to it, as shown. Shell ignites and produces proper temperature to flow solder into the splice. Burnt shell is then dropped off. *Jiggers, Inc, 215 W Illinois St, Chicago, Ill.*

6 LONG-NOSE CUTTER RETRIEVER—Unit compactly designed to cut wire with one-handed, one-fingered trigger operation and retrieve or hold in a powerful grip nuts, bolts, washers, cotter pins, etc, at inaccessible points. *Pack-Rite Machine Corp, N Broadway, Milwaukee, Wis.*

COMMUTATOR STONE—Excess film and dirt caused by heavy, continuous power loads can be easily and quickly removed from commutators with cleaning stone. "Ideal" stone cleans while motor or generator is running, and is used by simply holding it against the commutator and moving it slowly across the face. *Ideal Commutator Dresser Co, 1025 Park Ave, Sycamore, Ill.*

SOCKET AND TOOL SET—74-piece socket and tool set, known as No. BB1 has every piece selected because of its general utility value in service work of all kinds. Included in the set is an assortment of 14 sockets with double hexagon openings; three extra-deep sockets with double hexagon opening, two sockets with double square openings, plus wrenches, universal joints, hinge handles, etc. *Bonney Forge & Tool Works, Allentown, Pa.*

CALIPER—Pistol-grip caliper said to be useful for calibrating tube ends after rolling, or checking for erosion and corrosion points. Calibration effected by three points, and diameters from 2 to 6 in. can be secured with the same tool by using different sets of measuring points. *Airtool Mfg Co, Springfield, Ohio.*

DRILL—Skilldrill is ¼-in unit for fast production drilling, weighs 2¾ lb, and fits in palm of operator's hand. Has no-load speed of 1800 rpm, and full-load speed of 1050 rpm. Drilling capacity in steel is ¼ in. and in hardwood, 1½ in. *Skilsaw, Inc, 5030 Elston Ave, Chicago, Ill.*

TOOL STAND — Penco tool stand, for heavy-duty service, has all-welded steel construction, 12-gage steel shelves and heavy angle legs. Drawers are 5 in high, 18 in wide, 15 in deep, with a lock on each. *Penn Metal Corp of Pennsylvania, 36 Oregon, Philadelphia, Pa.*

TORQOMETER—New design of torque-measuring instrument said to be free from any inherent friction, assuring that torque readings shown on instrument dial are accurate and not affected by tool friction. *Snap-On Tools Corp, Kenosha, Wis.*

Types, Sizes and Weights for Every Pipe Welding Need

TUBE-TURN

WELDING FITTINGS

180° SHORT RADIUS RETURN

180° LONG RADIUS RETURN

180° EXTRA LONG RADIUS

90° LONG RADIUS ELBOW

90° SHORT RADIUS ELBOW

45° LONG RADIUS ELBOW

STRAIGHT TEE

REDUCING OUTLET TEE

CAP

LAP JOINT STUB END

CONCENTRIC REDUCER

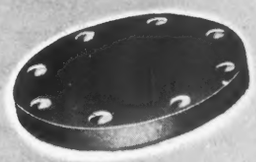
ECCENTRIC REDUCER

WELDING RING

STRAIGHT LATERAL

90° SHAPED NIPPLE

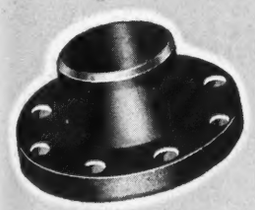
45° SHAPED NIPPLE



BLIND FLANGE

SADDLE

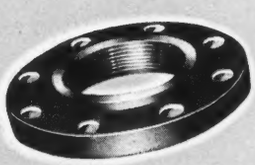
STRAIGHT CROSS



WELDING NECK FLANGE

SLIP-ON FLANGE

LAPPED FLANGE



SCREWED FLANGE

TUBE-TURN WELDING FITTINGS—RANGE OF SIZES

TYPE OF FITTING	DESCRIPTION	STANDARD WEIGHT	EXTRA STRONG	SCHEDULE 160	DOUBLE EXTRA STRONG
ELBOWS	90° LONG RADIUS	½"-24"	¾"-24"	1"-12"	1"-8"
ELBOWS	90° SHORT RADIUS	1"-24"	1½"-24"		
ELBOWS	45° LONG RADIUS	½"-24"	¾"-24"	1"-12"	1"-8"
RETURNS	180° LONG RADIUS	½"-24"	1"-24"	1"-12"	3"-8"
RETURNS	180° SHORT RADIUS	1"-24"	1½"-24"		
RETURNS	180° EXTRA LONG RADIUS	1"-2½"	1"-2½"		
TEES	STRAIGHT	¾"-24"	¾"-24"	1"-12"	1"-8"
TEES	REDUCING OUTLET	¾"-24"	¾"-24"	1"-12"	1"-8"
REDUCERS	Concentric and Eccentric	1x⅜"-24x20"	1x⅜"-24x20"		1x⅜"-12x10"
CAPS		1"-24"	1"-24"		1"-24"
STUB ENDS	LAP JOINT	1"-24"	1"-24"		
NIPPLES	Shaped, 90° or 45° to Header	1¼"-12"	1¼"-12"		
SADDLES		2"-24"			
LATERALS		1¼"-24"	1¼"-24"		
CROSSES		1¼"-24"	1¼"-24"		
RINGS		¾"-12"	1¼"-12"		
		150, 300, 400†, 600 and 900* Lb.		1500 Lb.	2500 Lb.
FLANGES	WELDING NECK	½"-24"		½"-24"	½"-12"
FLANGES	SLIP-ON	½"-24"		½"-12"	½"-12"
FLANGES	LAP JOINT	½"-24"		½"-24"	½"-12"
FLANGES	THREADED	½"-24"		½"-12"	½"-12"
FLANGES	BLIND	½"-24"		½"-24"	½"-12"

† Dimensions on sizes thru 3½" same as for 600 lb. flanges.

* Dimension on sizes thru 2½" same as for 1500 lb. flanges.

For sizes of light gauge and super-weight fittings, forged steel flanges, and for complete specifications on all Tube-Turn fittings, refer to *Tube-Turn Catalog.*

TUBE-TURN TRADE MARK *Welding Fittings*

The FIRST WELDING FITTINGS 1ST AND STILL THE BEST

TUBE TURNS, INC., LOUISVILLE, KY. *Branch offices:* **New York, Chicago, Philadelphia, Pittsburgh, Cleveland, Tulsa, Houston, Los Angeles, Washington, D. C.** ***Distributors in all principal cities.***

How to Straighten a Warped Soot Blower Element

Soot Blower Elements—the pipe sections with nozzles within the boiler—meet such severe service conditions that they sometimes become badly distorted. Wartime difficulty in obtaining replacements quickly makes it important to know how to straighten distorted elements with minimum risk of breakage.

Diamond elements are made in three types for various temperatures:

Plain Elements—made from extra heavy seamless steel tubing with the distal ends closed by spinning. Venturi type nozzles are electrically welded into the tubing. They can be readily recognized as steel tubes.

Calorized Elements—made from extra heavy or double extra heavy seamless steel tubing with the distal end closed by spinning, and Venturi type nozzles electrically welded into the tube walls are then impregnated with aluminum both inside and outside. They can be recognized by their bright appearance.

Dialoy Elements—made from seamless chrome iron tubing having a very high percentage of chromium. The distal ends are spun closed and Venturi nozzles are formed by building up a pad of alloy on the outside of the tube and drilling the nozzle through the pad and tube wall. Dialoy elements may be recognized by these welded pad nozzles and their yellow painted distal end.

Straightening Elements—If an element is not too badly distorted and the bearings are in proper alignment, it is frequently possible to straighten the element without removing it from the boiler. This is done by turning it to the point where it binds hard in the bearings and then leaving it in this position for a few hours.

If the element is so badly distorted that this method does not straighten it, remove it from the boiler.

Heat Calorized and plain steel elements to a cherry red (about 1500° F.) and then lay on a level floor or other surface. A wooden block should then be used to tap out the bent sections. The entire element should be heated at one time if at all possible; if not, the bent sections may be heated separately.

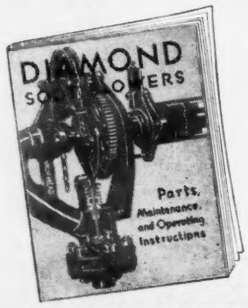
Dialoy elements should be heated to about 1650° F. (between a bright red and orange) and the same straightening process used as for Calorized and steel elements. After straightening, Dialoy elements should be quenched in water. If they cool considerably while being straightened, they should be reheated to 1650° F. and then quenched. Quenching of high chromium alloys softens or anneals the metal.

DIAMOND POWER SPECIALTY CORP., Detroit, Michigan

DIAMOND SPECIALTY LIMITED · Windsor, Ontario

Diamond Soot Blowers Have Been "Drafted"

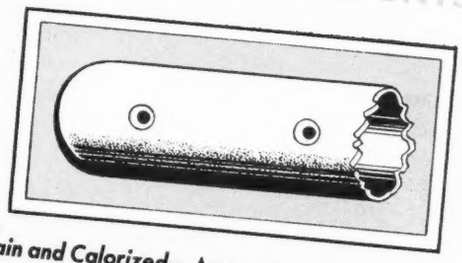
Careful Treatment Will Prolong the Life of Those You Have



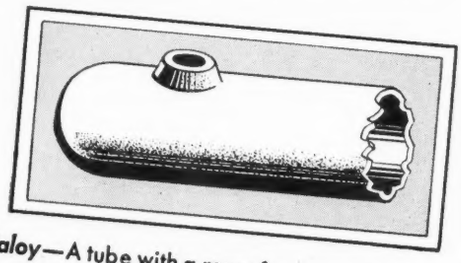
Almost the entire production of the Diamond plant is "drafted"—earmarked for war production. Hence, it is to your interest to make the soot blowers you have last as long as possible.

This is the second of a series of advertisements telling you how to do it. Send for a copy of the booklet on the care and maintenance of Diamond Soot Blowers.

THREE KINDS OF BLOWER ELEMENTS



Plain and Calorized—A smooth tube with a row of welded holes (nozzles) is either a plain or calorized element.



Dialoy—A tube with a row of pads through which nozzles are drilled is a Dialoy element.

HEAT FOR STRAIGHTENING

Heat plain and Calorized elements to 1500° F.—cherry red.

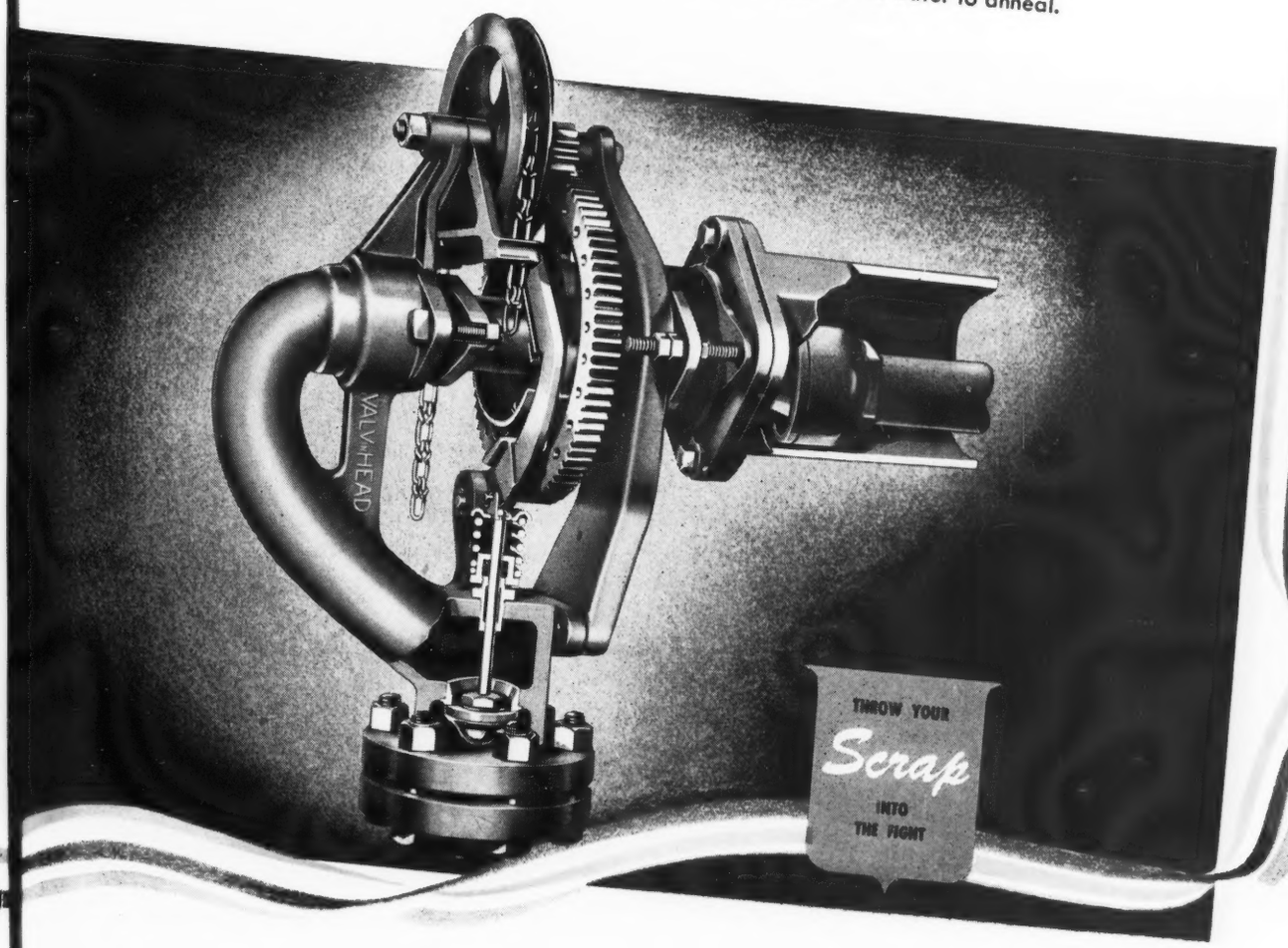
Heat Dialoy elements to 1650° F.—between bright red and orange.

ROLL ON FLAT SURFACE TO STRAIGHTEN

Tap at warped places with a wooden block. If the element cools considerably before straightening is complete, it should be reheated.

DIALOY ELEMENTS ONLY

Should be quenched in water to anneal.



Christmas, 1942

IT WAS ALMOST two thousand years ago that Jesus brought his message of hope for "peace on earth to men of good will." Before that, Isaiah prophesied a future when "They shall beat their swords into plowshares, and their spears into pruning-hooks; nation shall not lift up sword against nation, neither shall they learn war anymore."

Yet we today are fighting a war exceeding in savagery and in scope any that our world has ever known before. Not only are we fighting against oppressors for our very lives and freedom, but also against barbarous heathen for our belief in Him who promised us peace so long ago. Is there then any use in believing that our world can ever be any better—that it can ever even approach lasting peace?

We can believe. There is more than hope—there is cold, incontrovertible fact. Sums up Bruce Bliven, after an extensive survey: "The scientists who know most about these matters believe that war no longer pays, that a world without war is entirely possible, and that it can be obtained at the end of the present conflict. All that is necessary is that we shall sincerely desire it and utilize the recently discovered facts about human nature and human institutions in order to bring it about."

Once the victor in war took lands, animals, slaves. But power has changed all that. It is cheaper to build new factories than to move captured ones, cheaper to use machines than slaves. It costs more to collect reparations than they are worth—as the Allies found after the last war. Captured or tribute goods merely clog domestic markets, at a time when victorious soldiers must be reabsorbed by industry. In short, in our age of power, war does not pay.

Once the aggressor needed more nearby territory for his growing peoples. But populations are no longer growing rapidly. With power, modern agriculture and technology—and peace—our earth can support in luxury twice the people it now feeds. Further, there is no need to stay near home. The airplane, the ship, and surface transportation make even the farthest reaches of our planet close. The radio, the telephone, and the telegraph whisk our words throughout the world in fractional seconds.

Once aggressors claimed they needed raw materials. This is no longer true. Only in peacetime can anyone obtain all of the desired materials for which he is willing to pay. War is always preceded by building of stockpiles of raw materials—for war stops their flow.

Once it was believed that victory in war guaranteed essential foreign markets. Germany herself disproved that fallacy by capturing a large share of foreign markets after the last war. Our own "favorable" balance of foreign trade brought us most of the world's gold—and its resentment. Our foreign investments estranged our best friends among the nations. The outflow of our gold reduced the products available for home sale and created competing industry with lower living standards—hence lower production costs—combining to hold down our own standard of living.

Once war was "justified" as an outlet for emotions, as the inevitable result of our competitive instincts. Yet psychologists have never found any natural instinct for fighting, or any lasting emotional release in it. The international gangster, like the local one, is a victim of his environment. The man with a chip on his shoulder can be converted into a law-abiding citizen by proper training. The competitive instinct can be better satisfied by lasting achievement in the useful arts than by temporary gain in war. Those nations which are highest in the social scale—Sweden, Norway, Denmark, Switzerland—progressed only after they abandoned war for the arts of peace.

Is it conceivable that the average German, or Italian, or Japanese wants to fight any more than we do? Is he not rather the victim of gangster leadership, of herd instinct, of faulty beliefs? Is he not taught war—instead of peace? When this war is ended, can we not abolish that leadership, redirect that instinct, correct those faulty beliefs? Can not a nation be trained just as we already train an individual—and similarly without breaking its spirit?

In that way—and in that way only—lies the path to lasting peace. And this is the path toward which we must look, be it five, ten, or a hundred years away. For at its end is our promised land, where "nation shall not lift up sword against nation, neither shall they learn war any more."

George Edwards

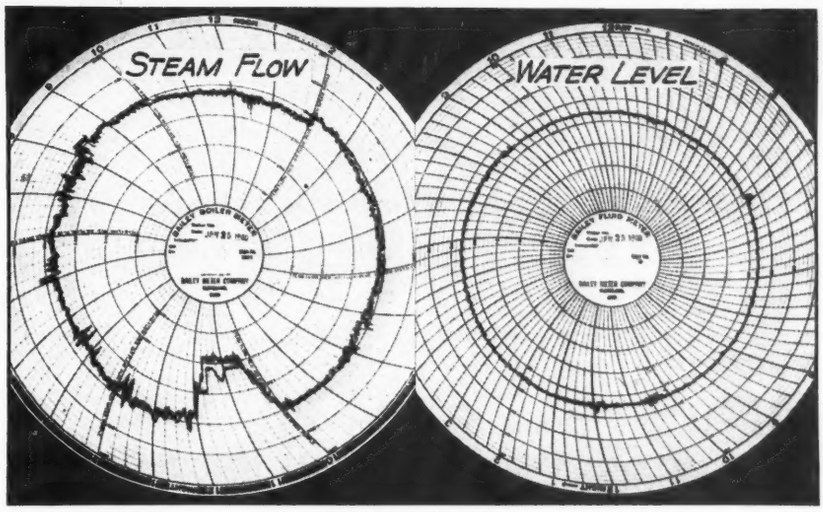
Engineer

"I firmly believe that if the people have the will to make this 'the last War', so shall it be! . . . This shall be 'the Last War' only if we can organize the world's economic and military power to make recurrence of aggressive wars impossible."

—Dr Hu Shih, former Chinese Ambassador to the United States

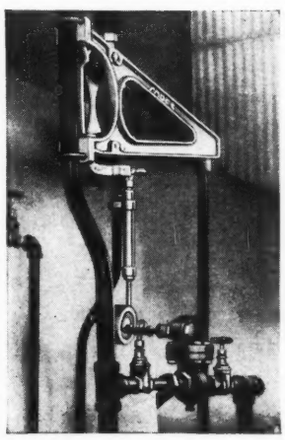
1300 POUNDS W. S. P.

Fired with pulverized coal or oil, this 1300-lb. B. & W. boiler in prominent Eastern utility plant normally evaporates 275,000 lb. per hour with a maximum 300,000 lb. Excess water pressure at pump discharge is 250-300 lb. Boiler water level held within plus or minus one inch of normal by the COPES Flowmatic.



★ *High excess water pressures have little effect on the level control*

FOR SMALL BOILERS



On small boilers at moderate ratings and pressures, the COPES Type OT quickly pays for itself with correct, continuous feed that means more steam per pound of fuel. Makes operation safer by stabilizing water level. Fully-automatic, it saves time for operators. Write for Leaflet P-2A.

YOU need not worry about high excess water pressure if a COPES Flowmatic Regulator controls the boiler feed and water level. These charts show water level varying only plus or minus one inch with an excess pressure of 250 to 300 pounds. In other cases, the Flowmatic has continued to hold the level well within desired close limits with excess rising above 450 pounds. And service is dependable because even the relay-operated Flowmatic, used for high pressures, has as few parts as possible and each part is built to stand up under much more severe conditions than it will meet in operation. Write for Bulletin 429.

NORTHERN EQUIPMENT CO., 621 GROVE DRIVE, ERIE, PA.

Feed Water Regulators, Pump Governors, Differential Valves
Liquid Level Controls, Reducing Valves and Desuperheaters

BRANCH PLANTS IN CANADA, ENGLAND REPRESENTATIVES EVERYWHERE

★ GET CLOSER LEVEL CONTROL WITH THE COPES FLOWMATIC ★ REGULATOR

NEW CATALOGS, BOOKLETS, BULLETINS

For Your Convenience—Copies of the literature described on this and following pages may be obtained by filling out the business-reply cards on page 135

Over 350 items have been described, covering practically all equipment and supplies used by power engineers. So don't get worried if your requests fail to come back to you by return mail, because it will take two or three weeks at least to sort and classify the return cards. We have made our New Year's resolution in advance to get literature to you as quickly as possible

AIR CONDITIONING

1 AIR CONDITIONERS—Air and Refrigeration Corp, 475 Fifth Avenue, New York, N. Y. 24-page bulletin G-2 describes the capillary cell and its application in air conditioning equipment as direct heat-transfer surface between water and air. Outlines function of cells for cooling and dehumidifying, evaporative cooling, condenser water cooling, etc.

BEARINGS

2 STEEL BALLS FOR BEARINGS—Atlas Ball Div, SKF Industries, Inc, Front St and Erie Ave, Philadelphia, Pa. 8-page catalog describes method used in making balls round. Ten steps are necessary before a steel ball is made round; they are: pressing, flashing, rough grinding, multiple-groove grinding, tumbling, heat treating, precision grinding, lapping, inspection and gaging. Each step fully illustrated.

3 BEARING METALS — Magnolia Metal Co, 18 West Jersey St, Elizabeth, N. J. 8-page bulletin describes various lead-base metals which have proved to be excellent substitutes for tin-base bearing metals. Also contains suggestions for best results in making and maintaining journal bearings, and a table of recommendations for selecting correct bearing metal for 135 different types of machinery.

4 BEARINGS — R-S Products Corp, 4530 Germantown Ave, Philadelphia, Pa. 4-page bulletin No. 11-C explains low unit cost in small or large quantities of standard covers for ball and roller bearings. Also contains detailed drawings, sizes, styles, etc.

5 BEARINGS—Johnson Bronze Co, 508 S Mill St, New Castle, Pa. 36-page catalog L-3 outlines Ledaloyl self-lubricating bronze bushings and bearings in standard stock sizes which eliminates the cost of extra tools and dies.

BELTING

6 V-BELTS—Allis-Chalmers Mfg Co, Texrope Div, Milwaukee, Wis. 16-page pocket-size handbook entitled, "Plain Facts on Wartime Care of Rubber V-Belts," applies to all makes of V-belts and explains ways V-belt construction affects maintenance, what determines life expectancy of a set of V-belts and what to do about worn sheaves.

7 BELTING—L H Gilmer Co, Tacony, Philadelphia, Pa. 32-page illustrated book, No. 360, entitled "Special-Purpose Belts" describes belts for special applications that involve factors such as speeds, close precision, shock loads, double-friction surface, light duty, etc. Lists multiple and fractional-horsepower V-belts; connected-type V-belting, endless round and endless cord flat belts.

8 RUBBER BELTING—Robins Conveying Belt Co, Passaic, N. J. Wall chart, approximately 11x14 in., gives hints for proper care of rubber conveyor belting. Many photographs included which show ways of taking care of rubber belting.

9 V-BELTS—Allis-Chalmers Mfg Co, Milwaukee, Wis. Bulletin B6051-C, 12 pages, reduces engineering information to simplified charts and tables for quick V-belt selection. From known factor and special service factor tables, correct V-belt and sheave sizes can be determined. List prices, stock sizes, dimensions and construction details included for all Texrope drives.

BLOWERS

10 BLOWERS — Roots - Connersville Blower Corp, Connersville, Ind. 20-page bulletin No. 22-23-B-11 discusses and illustrates rotary positive-displacement blowers, their operating principles, design and construction features, for use in sewage-treatment plants, water works, chemical process industries, pneumatic-conveying systems, and varied applications throughout many industries.

BOILERS

11 BOILER OPERATION—Bailey Meter Co, Cleveland, Ohio. 20-page bulletin No. 16, entitled "How to Safely Stretch Steaming Capacity," explains how proper use of metering and control equipment stretches capacity, avoids shutdowns, insures safety, furnishes data for fuel comparison, reduces fuel consumption, and maintains efficiency while new operators are trained.

12 BOILERS—Combustion Engineering Co, Inc, 200 Madison Ave, New York, N. Y. 16-page catalog gives details of design and construction of hrt boilers, contains various setting drawings and tables of standard dimensions for both brickset and steel-encased settings, and illustrates installations with different methods of firing. Includes typical furnace arrangements for burning bagasse.

13 STEAM GENERATORS—Vapor Car Heating Co, 80 East Jackson Blvd, Chicago, Ill. 21-page catalog describes Vapor "Packaged Steam" Generator and several types of valves, traps, metallic joints, thermostatic controls, heat exchanger and thermo-balancer.

BOILER ACCESSORIES

14 COAL CRUSHER—American Pulverizer Co, 1249 Macklind Ave, St. Louis, Mo. 8-page folder shows operation and points out advantages of American ring crusher. Shows how crusher is constructed and gives comparisons between coal crushed by ring and roll crushers.

15 IGNITION SYSTEM—The Engineer Co, 75 West St, New York, N. Y. Bulletin outlines the Enco automatic retractable oil or gas ignition system for lighting pulverized coal with remote control. This system also serves as a standby for pulverized coal or other fuel when it is necessary to clear mill or feed pipes, replace fuses, etc.

16 OIL BURNING — The Hotstream Heater Co, Combustion Equipment Div, 8007 Grand Ave, Cleveland, Ohio. 4-page manual of information on oil burning contains data and correlative tables covering all factors governing industrial oil-burning problems, with special emphasis on the value of proper draft control.

INDEX TO MANUFACTURERS' LITERATURE

Air-Conditioning Equipment	120	Maintenance Equipment	126
Bearings	120	Materials-Handling Equipment	126
Belting	120	Metal Hose & Tubing	128
Blowers	120	Metals & Metal Spray	128
Boilers	120	Meters & Instruments (not electric)	128
Boiler Accessories	120	Motors	130
Clutches & Couplings	122	Paints & Coatings	130
Combustion & Other Control	122	Piping & Fittings	130
Compressors & Accessories	122	Pumps	132
Diesels & Accessories	124	Refractories	132
Dust Collectors	124	Refrigerating Equipment	134
Electric Meters & Instruments	124	Stokers	134
Fans	124	Switches, Circuit Breakers	134
Gears, Pulleys and Chains	124	Tools	134
Generators & Accessories	124	Valves	134
Heating & Ventilating Equipt.	124	Water-Treating Equipment	136
Insulation	126	Welding Equipment	140
Lubricating Equipment	126	Other Equipment & Supplies	140

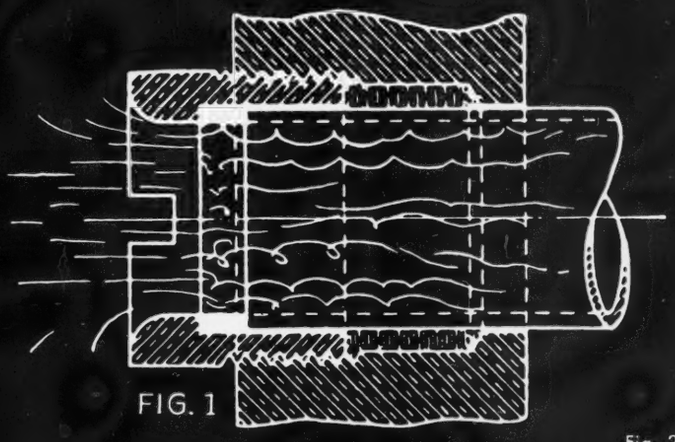


FIG. 1

Fig. 1 shows what happens when tubes are not fitted tightly against the shoulders of the ferrules. The turbulence created will result in tube-end erosion.

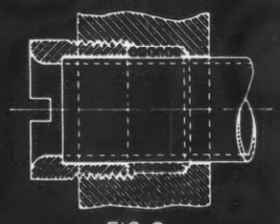


FIG. 2

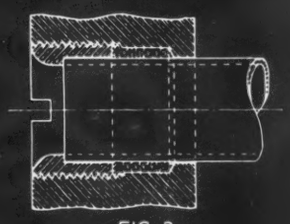


FIG. 3

Fig. 2 shows conventional type ferrule packed at inlet end.

Fig. 3 is flush type ferrule packed at inlet end.

Fig. 4 shows fitted tube rolled at inlet end, the preferred setting.

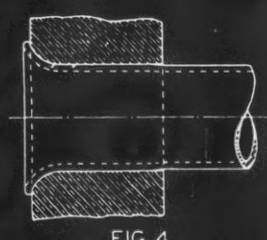


FIG. 4

How to *Prolong* CONDENSER TUBE LIFE!

MANY causes of condenser tube trouble *can* be eliminated . . . and many tubes can be saved even after slight damage has taken place, thus prolonging tube life and conserving copper, and other strategic metals.

The principal causes of trouble are excessive local turbulence, finely divided air bubbles, and solids in the cooling water. The last two will be discussed in succeeding advertisements.

TURBULENCE—When tubes are installed by the ferrule method, special care should be taken to set them against the shoulders of the ferrules to avoid excessive turbulence of the entering water. Turbulence is the principal cause of erosion of condenser tubes at inlet ends. Figure 1 illustrates incorrect assembly and resultant water turbulence.

After the tubes have been correctly set into the ferrules (Figure 2) they may be rolled so that they will remain in place; otherwise changes in temperature may cause the tubes to creep away from the ferrule shoulder.

Trapped solids will cause turbulence and local pitting. Rolling and flaring the tubes in the entrance end without ferrules is the preferred method as it helps to prevent lodging of foreign matter at the ends of the tubes.

More complete information on how to prolong condenser tube life can be obtained simply by sending request on a letterhead to the address below. 4288

ANACONDA
from mine to consumer

Anaconda Condenser Tubes

THE AMERICAN BRASS COMPANY—General Offices: Waterbury, Connecticut

Subsidiary of Anaconda Copper Mining Company • In Canada: ANACONDA AMERICAN BRASS LTD., New Toronto, Ont.

17 GAS BURNERS—J O & C U Martin, 637 Minna St, San Francisco, Cal. 6-page folder AIA 30G4 describes Glowan gas burners with photographs and diagrams. Also contains tables of capacities and specifications with typical setting illustrations.

18 GAS BURNERS—Peabody Engineering Corp, 580 Fifth Avenue, New York, N. Y. Bulletin No. 203, 4 pages, features Peabody combined gas and oil burners in types A and H, available in a full range of sizes with individual burner capacities up to approximately 100,000,000 Btu per hour.

19 FURNACE DOOR—Plibrico Jointless Firebrick Co, 1800 Kingsbury St, Chicago, Ill. Literature introduces new type of furnace door, for easy access, inspection and clean-out of boilers, incinerators, etc, featuring Lock-tite handle which eliminates excess air around door and thus contributes to combustion efficiency.

20 BOILER LININGS—Ramtite Co, 2549 West 18th Street, Chicago, Ill. 16-page bulletin entitled, "The Better Method of Setting and Lining Return Tubular Boilers" explains improvements in setting and relining boilers and discusses engineering properties of Ramtite plastic refractories.

21 GAS AND OIL BURNERS—Peabody Engrg Corp, 580 Fifth Ave, New York. 4-page bulletin No. 702 describes Peabody combined gas and oil burner, for petroleum refinery furnaces, with removable gas burner ring and general air register, and oil atomizer improvements.

22 SAFETY WATER COLUMNS—Reliance Gauge Column Co, 5902 Carnegie Ave, Cleveland, Ohio. 16-page catalog No. 414 discusses safety water columns and accessories for steam pressures up to 250 lb. Includes dimension and selection tables, diagramed installation instructions and other illustrations.

23 UNIT PULVERIZER — Sims Co. Erie, Pa. New booklet includes history and development of pulverized coal, detailed discussion on burning pulverized coal, complete description of pulverizer and burner, performance data on service and savings, and numerous application drawings.

24 TUBE CLEANERS—Thomas C Wilson, Inc, 47-28 37th Street, Long Island City, N. Y. Catalog No. 42, 36 pages, describes Wilson tube cleaners operated by air, steam, water and electricity for cleaning tubes of all kinds in which scale, carbon, rust or sludge form.

26 COAL CRUSHERS—McNally-Pittsburg Mfg Corp, 307 No Michigan Ave, Chicago, Ill. 20-page bulletin No. 342 tells development story, mechanical principles of crushers and breakers in relation to the crushing and breaking of coal sizes, capacity and dimension charts, line drawings and diagrams, machinery pictures, and construction features.

CABLE, WIRE, FUSES

27 CABLES—General Electric Co, Schenectady, N. Y. 8-page bulletin, GEA-3652 describes "GF" gas-filled cable, self-supervising for 10-kv to 40-kv service, its principles, advantages, uses, performance and accessories with charts and diagrams.

CLEANING EQUIPMENT

28 CLEANER—Brunt Equipment Co, 64 South Division St, Buffalo, N. Y. 6-page folder describes the Vibratap, a vibratory cleaner which removes scale by mechanical means that breaks hold of deposit on metal and is said to result in complete cleaning. Also illustrates Vibratap for both fire-tube and water-tube boilers.

29 SLUDGE ELIMINATOR — Standard Chemical Co, Natick, Mass. Bulletin describes Kil-sludge, said to eliminate sludge conditions in tanks and pipelines that make combustion incomplete, waste fuel, and cut down efficient burning of fuel oil.

30 CLEANERS—Magnus Chemical Co Inc, Garwood, N. J. 24-page bulletin entitled "The Care and Cleaning of Hands and Arms in the Industrial Plant", is designed for safety engineers, plant superintendents. A few phases discussed are: safe detergents and scouring agents, germicides and medicants, lime scums and rinsing, cleaning routines and protection of hands and arms on the job.

31 CLEANING MACHINE—L&R Mfg Co, 5456 Clinton St, Newark, N. J. Single-sheet leaflet describes heavy-duty precision cleaning machine that cleans, rinses, polishes and dries small parts too fragile to be cleaned by hand. Photographs of machine and component parts are also furnished.

CLUTCHES & COUPLINGS

32 CLUTCHES—Morse Chain Co, 7601 Central Ave, Detroit, Mich. 6-page bulletin No. K-6 presents principles, characteristics, advantages and detailed construction of Morse indexing and freewheeling clutch lines. Gives diagramed and charted engineering data, including power-speed ratios, load capacities, complete dimensions and prices.

33 FLEXIBLE COUPLING — W H Nicholson & Co, 12 Oregon St, Wilkes-Barre, Pa. 8-page bulletin No. 642 features Nicholson flexible coupling, its construction, function, lubrication, strength, durability, and capacity. Also includes list of prices, dimensions and weights.

COMBUSTION & OTHER CONTROLS

34 TEMPERATURE CONTROL SYSTEMS—Automatic Temperature Control Co, Inc, 34 East Logan St, Philadelphia, Pa. 12-page catalog A14, shows full line of electric motor valve operators as applied to standard temperature control systems for fuel-fired furnaces. Tabulated data and wiring diagrams are also provided.

35 AUTOMATIC CONTROLS — Bailey Meter Co, Cleveland, Ohio. 8-page bulletin No. 103 describes Standatrol, said to provide stable, standardizing automatic control under adverse conditions. Book also contains many diagrams illustrating features, principles and method of operation.

36 CONTROLS — Brown Instrument Co, Philadelphia, Pa. Bulletin No. 8301, 56 pages, describes electric, pneumatic, as well as combined controls and defines various technical terms used in descriptions. Photographs illustrate 44 industrial controls and safeguards such as temperature controllers, float switches, combustion safeguards, etc.

37 CONTROLS — A Schrader's Son, Dept P, 470 Vanderbilt Ave, Brooklyn, N. Y. Catalog contains descriptions of new line of industrial products for use in control of compressed air. Contains many photographs, diagrams, tables and charts for those interested in production as well as compressed air and control.

38 CONTROLS—C J Tagliabue Mfg Co, Park and Nostrand Aves, Brooklyn, N. Y. Catalog No. 900E describes TAG non-indicating temperature and pressure controllers with photographs, diagrams and tables of specifications.

39 CONTROLS — Wheelco Instrument Co, Harrison and Peoria Sts, Chicago, Ill. Condensed catalog lists principal items of equipment manufactured by company including capacitrols, potentiometers, pressure controls, proportioning controls and thermocouples. Also designates individual bulletins on each control described.

40 TIME CONTROLS—Automatic Temperature Control Co, 34 East Logan St, Philadelphia, Pa. 8-page catalog B10 lists application, construction, types and operating features of series 2800 timers. Booklet also includes wiring diagrams, tables, electrical data, case drawings and illustrations.

41 RHEOSTATS—James G Biddle Co, 1211-13 Arch St, Philadelphia, Pa. 4-page bulletin, No. 1705, outlines Jagabi rheostats in four sizes and 76 ratings. Several types illustrated and prices applying given.

42 CONTROLS—Brown Instrument Co, Wayne & Roberts Aves, Philadelphia, Pa. Bulletin No. 29-34 describes Brown deaerator control system. Also includes descriptions of principles involved and application data. Schematic diagrams show how system is hooked up for boiler operation.

43 CONTROLS—J A Campbell Co, 651 Wardlow Road, Long Beach, Cal. Bulletin presents two boiler feedwater-level controllers—pilot-operated and rotary. Also describes other recently introduced products including Campbell Micro-Bean, stainless steel thermometer wells, gas samplers, and feet-gage strips.

44 PUMPING CONTROL—The Foxboro Co, Foxboro, Mass. 8-page bulletin, No. B-294, describes Rotax electric-operated control—in recording and indicating types, as employed in pumping applications. Schematic diagrams and photographs of typical installations are given together with specimen chart records.

45 CONTROLS—Hetherington & Berner Inc, 701-745 Kentucky Ave, Indianapolis, Ind. 4-page booklet presents the Fluidometer system of completely automatic control for measuring liquid batches. System resets automatically and is said to be accurate, rapid, and dependable.

46 AUTOMATIC FEED CONTROL—Max Mosher, 130 West 42nd St, New York, N. Y. Bulletin deals with latest electronic control which automatically regulates feeding rate of pulverizing machines in accordance with different materials and conditions. Control warns instantly of overloading, underloading, etc.

47 CONTROLS—The Hotstream Heater Co, 8007 Grand Avenue, Cleveland, Ohio. 4-page folder covers Hotstream line of combustion controls, damper regulators, and modulating controls for increasing efficiency in steam generation.

48 CONTROLS — Mason-Neilan Regulator Co, 1186 Adams St, Boston, Mass. 24-page general catalog No. 41 covers company's line of automatic control equipment for pressure, temperature, rate of flow, liquid-level, etc, with descriptions, diagrams, and tables of technical data.

49 SPEED CONTROL—Reeves Pulley Co, Columbus, Ind. 16-page booklet No. G-423 illustrates and describes uses and applications for Reeves variable-speed control equipment in defense industries and plants on many different machines. Among equipment described in booklet is variable-speed transmission, vari-speed motor pulley and motor drives.

50 SIGNAL CONTROL—Otis Elevator Co, 260 11th Ave, New York, N. Y. Single sheet B-536 describes signal-control operating panel furnished for signal-control elevators. Normal operation involves only two simple steps on part of attendant.

51 CONTROLS—B F Sturtevant Co, Hyde Park, Boston, Mass. Bulletin No. 446, 28 pages, features vane control for mechanical draft fans. Furnishes data on fan output and power input, fan characteristics, variable-speed control, principle of Sturtevant vane control, etc. Also contains numerous photographs of typical installations.

52 CONTROLS—Foxboro Co, Foxboro, Mass. Bulletin No. A-330 explains theory of Hyper-Reset which is not an instrument or mechanism but a control function, available in the newly-designed model 30 Stabilog controller for applications where process-lag is considerable.

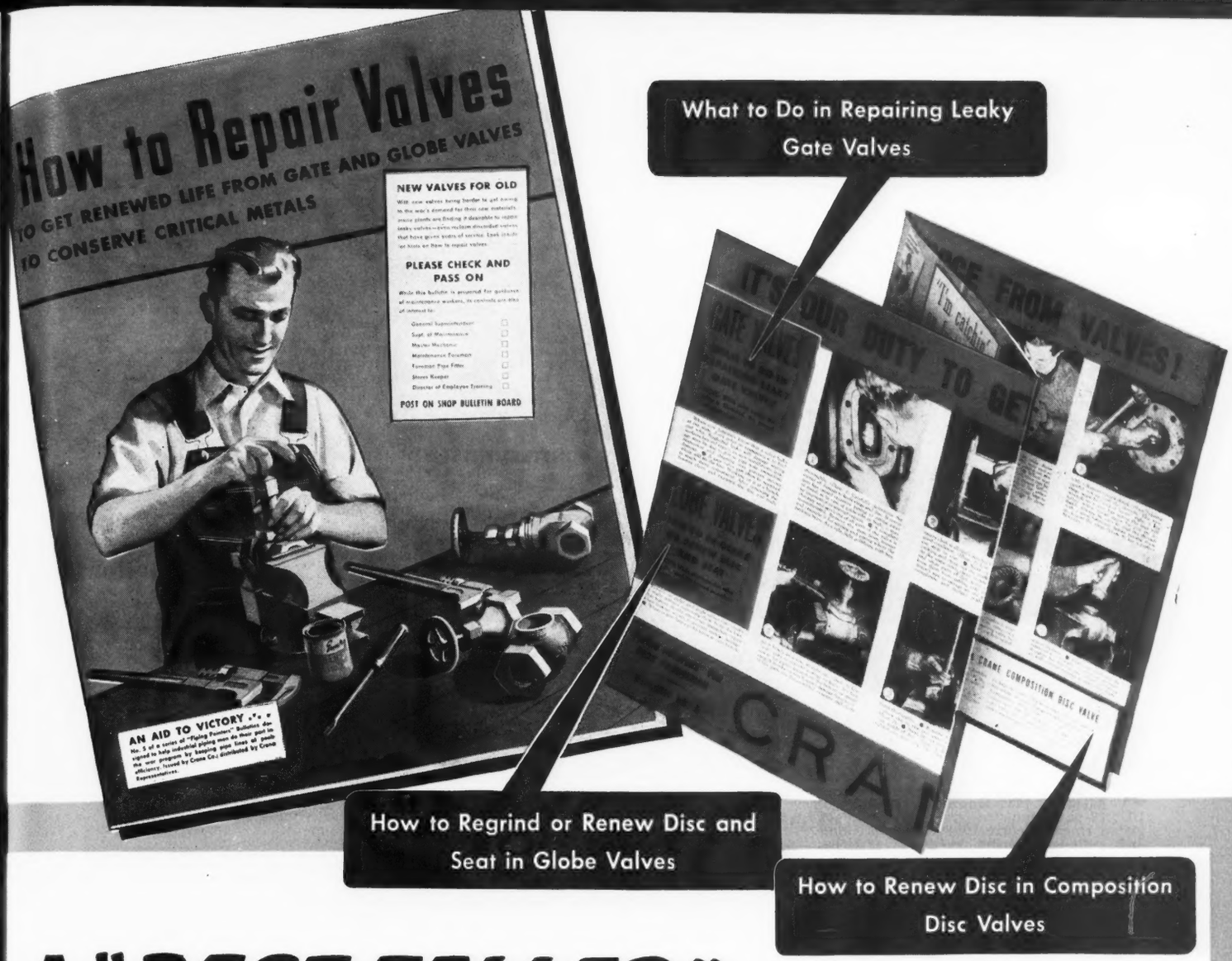
53 COMPENSATED CONTROL — Barber-Colman Co, Rockford, Ill. Bulletin contains detailed information on features of Barber-Colman compensated control for zone temperature control work. Heat anticipation is provided only when needed and in the amount required by a particular weather condition.

54 CONTROLS—The Hotstream Heater Co, 8007 Grand Ave, Cleveland, Ohio. 4-page bulletin covers the Hotstream line of combustion controls, regulators, and modulating controls for increased efficiency in generation. Also shows practical boiler-room applications of controls, including the electric piston, Steptrol and Lectrogage.

55 HYDRAULIC CONTROL — Sperry Products, Inc, Hoboken, N. J. 4-page bulletin EHC-78-C discusses Sperry "Exactor" hydraulic control, its applications, advantages and accessories. Photographs and diagrams are also included.

COMPRESSORS AND ACCESSORIES

56 COMPRESSORS — Clark Bros Co, Olean, N. Y. Booklet entitled, "Maintenance Hints for Clark 'Angle' Two Cycle Gas-Engine-Driven Compressors," considers proper maintenance and methods for solving compressor troubles. Also con-


How to Repair Valves
TO GET RENEWED LIFE FROM GATE AND GLOBE VALVES
TO CONSERVE CRITICAL METALS
NEW VALVES FOR OLD
PLEASE CHECK AND PASS ON
POST ON SHOP BULLETIN BOARD
AN AID TO VICTORY
What to Do in Repairing Leaky Gate Valves
How to Regrind or Renew Disc and Seat in Globe Valves
How to Renew Disc in Composition Disc Valves

A "BEST TELLER" FOR PIPING MEN

Look at the timely subjects covered in "Piping Pointers" Bulletin No. 5. What is more important to piping men—NOW—than knowing how to repair valves for better and longer service—to keep war production lines flowing—to conserve critical metals! Frankly, we don't know of any other current source of such vital information.

"Piping Pointers" are designed to help you train men for the big maintenance job that faces industry at war. Based on the vast experience of America's leading producer of valves and fittings—CRANE—their content is fully accurate and practical. Even veteran workers use "Piping Pointers" to keep up-to-date on the *kinks* of the trade.

FREE TO ANY PLANT

In "Piping Pointers," Crane shares its basic information with all industries producing for Victory. This service is *absolutely free,* yet countless plants have testified to its inestimable value in maintenance shops and employee training schools. If you're not using "Piping Pointers," you owe it to Victory to let your Crane Representative arrange for your supply.

HOW TO KEEP YOUR PLANT GOING WITHOUT INTERRUPTION!
TIPS ON VALVE TRIM TO HELP KEEP PIPING ON THE JOB
HELPFUL HINTS ON CHOOSING VALVES FOR BETTER PIPING SERVICE

Five "Piping Pointers" Bulletins have been published to date. To meet the demand, extra supplies of all editions have been printed. Get the entire series now *—when you need them* most. *First come first served.*

CRANE

CRANE CO., GENERAL OFFICES:
836 SOUTH MICHIGAN AVENUE, CHICAGO

VALVES • FITTINGS • PIPE
PLUMBING • HEATING • PUMPS

NATION-WIDE SERVICE THROUGH BRANCHES AND WHOLESALERS IN ALL MARKETS

tains hints for reducing maintenance and repair costs.

57 COMPRESSORS — Fuller Co, Catasauqua, Pa. 16-page booklet C5 describes Fuller rotary compressors and vacuum pumps. Many line diagrams, cross-sections, photographs of machines, typical installations and numerous tables are contained.

58 AIR COMPRESSORS—Schramm Inc, West Chester, Pa. Catalog 42-S, 12 pages, presents the standard Schramm stationary compressors for heavy-duty, continuous service with minimum attention. Photographs, diagrams, tables of specifications, and brief descriptions furnished.

59 COMPRESSORS—Worthington Pump and Machinery Corp, Harrison, N. J. 28-page bulletin No. L-675-B1 features Worthington feather valve compressors, 75 to 3000 hp, horizontal duplex, motor-driven, direct-connected and belted. Photographs and cross-sectional diagrams illustrate characteristics, application and maintenance of these machines.

60 COMPRESSORS—Norwalk Co, Inc, South Norwalk, Conn. Catalog No. 37, 32 pages, discusses Norwalk multistage high-pressure air and gas compressors, in standard types and special service models. Varieties of compressors in most common use are described. Also includes many photographs and diagrams.

60A COMPRESSOR—B F Sturtevant Co, Hyde Park, Boston, Mass. 18-page booklet 386-2 lists Sturtevant centrifugal compressors, Design 9, showing outstanding features efficiency, design, sizes to choose from, arrangement of drives, and giving ratings.

DIESELS AND ACCESSORIES

61 PISTON RINGS — Cooktite Ring Sales Co, 1737 Howard Ave, Chicago, Ill. 12-page bulletin shows relation of piston rings to correction of ring sticking and cylinder scoring in diesel engines. Photographs illustrate reasons for ring sticking and cylinder scoring. Booklet also suggests location of oil-control rings for different engines.

62 DIESELS—Hill Diesel Engine Co, Lansing, Mich. Specification sheets, 9, cover company's line of diesel-generator sets, engines and power units in three sizes, 2, 4 and 6 cylinders. Also show photograph and dimensional diagram of each type described.

63 DIESEL COOLERS — Fairbanks, Morse & Co, Chicago, Ill. 16-page bulletin FECD-2 covers complete line of Fairbanks-Morse evaporative coolers for diesel engines with photographs and diagrams. Tables of recommended sizes for diesel and gas engines, water-cooling capacity, dimensional drawings and piping diagrams are also included.

64 DIESEL ENGINES—National Supply Co, Superior Engine Div, Springfield, Ohio. 16-page bulletin 138 covers 9x12-in. stationary diesel engines which can be converted into gas engines. Also contains diagrams of engines and principal parts as well as installation photographs.

65 DIESELS—Nordberg Mfg Co, Milwaukee, Wis. 8-page bulletin 106 discusses Nordberg gas-burning diesels which are quickly converted to natural gas or oil and operate on full diesel principle. Includes typical installation photographs.

66 PISTON RINGS — Cooktite Ring Sales Co, 1737 Howard Ave, Chicago, Ill. 12-page bulletin, No. 5-342, entitled "Stop Compression Losses and Obtain 10 to 20% More Power" tells how Cook's graphite-iron piston rings prevent blowby completely, even in worn cylinders.

67 PISTON RINGS—Wilkening Mfg Co, Philadelphia, Pa. 60-page book discusses accepted practices in general motor reconditioning, with special emphasis on piston-ring installations. This discussion, illustrated by photographs, drawings and charts, is equally applicable to automotive engines, small power plants and stationary engines used in compression and refrigeration fields.

69 PISTON RINGS — Cooktite Ring Sales Co, 1737 Howard Avenue, Chicago, Ill. 8-page book entitled "Save One Out of Ten Gallons of Fuel" discusses advantages of Cooktite piston rings in question and answer form with charts, diagrams and photographs.

DUST COLLECTION

70 FLYASH ELIMINATION — Western Precipitation Corp, 1016 W 9th St, Los Angeles, Cal. 24-page book contains flyash collection information with graphs, diagrams, tables of collection efficiencies, methods of preliminary tests and suggestions on procedure.

71 DUST RECOVERY—Buell Engrg Co, 70 Pine Street, New York, N. Y. 28-page book contains facts and data prepared by engineers in company's dust-testing laboratory. Many photographs, diagrams, tables and charts illustrate principles and practice of dust recovery, with special emphasis on cyclone collectors used in many industries.

ELECTRICAL METERS & INSTRUMENTS

72 SPEED CHANGERS—Allis-Chalmers Mfg Co, Milwaukee, Wis. 20-page bulletin B6013A includes diagrams, operating data and selection tables of speed changer units in sizes handling from 1½ to 75 hp. Also contains numerous photographs illustrating modern speed-changing equipment.

73 ELECTRICAL CONNECTORS — Burndy Engrg Co, 459 East 133rd St, New York, N. Y. Pocket-size catalog, 48 pages, illustrates 75 electrical connector types with catalog listings of important connector sizes. Also contains helpful wiring data.

74 CAPACITORS—Cornell-Dubilier Elec Corp, South Plainfield, N. J. 6-page folder weighs a familiar plant problem—overtaxed electrical systems, insufficient line, transformer and switching equipment capacity—then presents a solution that boosts factory output while saving time, materials and labor.

75 VOLTAGE REGULATORS—General Electric Co, Schenectady, N. Y. 16-page spiral-bound book entitled "Undervoltage, the Unseen Hindrance to War Production" states that proper voltage is important to war production and that the use of regulators saves copper, manhours, and cuts installation time.

76 INSTRUMENTS—Radio City Products Co, 127 West 26th St, New York, N. Y. Bulletin No. 126 covers new RCP instruments for laboratory and production use, such as new electronic limit bridge for precision resistance testing, and a highly versatile multitester for quick and accurate production-line tests.

77 HIGH-VOLTAGE INDICATORS — Air Reduction Co, 60 East 42nd St, New York, N. Y. illustrated pamphlet describes Airco's complete line of high-voltage indicators, specifically designed for protection of men working on high-voltage lines. Complete construction, installation and operating details are featured with photographs of the indicators in actual use and suggested method of mounting.

78 INSTRUMENTS — Roller-Smith Co, Bethlehem, Pa. 12-page catalog, 4220, describes ac and dc indicating instruments for switchboard mounting. Dimensions, weights and list prices on all instruments are included.

FANS

79 FANS — Kontrol-Fans, Inc, 4031 Goodwin Ave, Los Angeles, Cal. New bulletin, 4 pages, features Kontrol-Fans with thermostatically operated controllable-pitch blades for use in stationary power units, trucks, buses, compressors, cooling towers and all fan-cooled prime movers.

GEARS & PULLEYS

80 PULLEYS—The American Pulley Co, Philadelphia, Pa. 16-page catalog features compact speed-reduction units, emphasizing installation ease in mounting shaft of driven machines. Reduction drives made in six sizes from ½ to 25 hp. Also contains photographs, diagrams and tables.

GENERATORS & ACCESSORIES

81 TURBINES—Moore Steam Turbine Div, Wellsville, N. Y. 6-page folder, Bulletin 1955, describes type "S" multi-stage steam turbines with photographs of component parts and a longitudinal section of a typical turbine. Also shows the special features of the "S" type and lists the standard features of Moore turbines.

82 STEAM GENERATORS — Union Iron Works, Erie, Pa. 4-page bulletin 27 discusses Union H-type steam generators, self-contained units with steel-cased settings. Details of construction and principles of operation are shown by many photographs and diagrams.

83 TURBINES—Moore Steam Turbine Div, Wellsville, N. Y. 6-page bulletin No. 1951 illustrates the special features of types GA & GB steam turbines with combined reduction gears. Also contains photographs of typical installations.

83A AC GENERATOR—Westinghouse Electric & Mfg Co, Dept 7-N-20, East Pittsburgh, Pa. 16-page bulletin B-3028 describes large ac generators, from 25 to 2183 kva, for diesel-engine drive, to be used in municipal lighting plants and for industrial emergency power. Discusses rotor and stator constructions, emphasizing effective ventilation, insulation tests, and design features to give lifetime operation.

HEATING & VENTILATING EQUIPMENT

84 HUMIDIFIERS—Armstrong Machine Works, 812 Maple St, Three Rivers, Mich. Booklet tells facts about humidification; describes Armstrong humidifiers with tables, diagrams, and photographs. Also furnishes hookup diagrams and recommended pipe sizes.

85 HEATERS — Dravo Corp, Heater Dept, Dravo Bldg, Pittsburgh, Pa. 12-page bulletin No. 506 presents tabulations, based on approximately same required Btu output per hour, shows less floor space requirements for direct-fired heaters. Also demonstrates speed of installation with fewer man hours and least maintenance requirements. Explains principles of combustion chamber, heat transfer, and fuel economies.

86 HEATING—Induction Heating Corp, 389 Lafayette St, New York, N. Y. Data sheet entitled, "Fundamentals of Induction Heating" is first in a series which will make up course in the fundamentals and applications of induction heating. Sheet No. 1 covers elemental theory.

87 UNIT HEATERS—McQuay Inc, 1600 Broadway, N E, Minneapolis, Minn. 12-page bulletin No. 770 features McQuay unit heaters for diesel-engine heat recovery which transfer heat from jacket water to air in occupied rooms and offices, produce correct temperature conditions during heating season and provide for proper engine cooling all year.

87A HEATING — The Girdler Corp, Thermex Div, Louisville, Ky. 22-page booklet presents the principle of high-frequency electrostatic heating, and how Thermex is applied to industrial processes for manufacturing numerous products. Includes power flow diagram.

88 UNIT HEATERS—Modine Mfg Co, Racine, Wis. Bulletin 142, 8 pages, features style I/S horizontal-delivery unit heaters which retain all performance and structural features that characterize the copper-condenser model. Also contains tables of constants for steam and hot water.

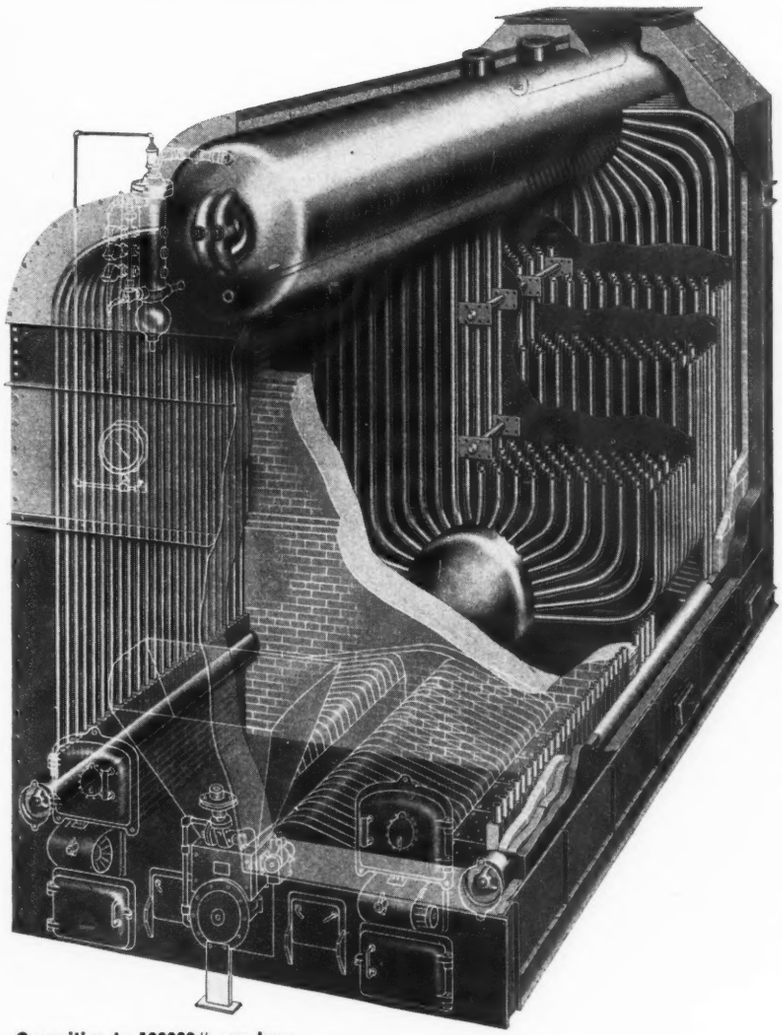
89 HEATERS, FANS—B F Sturtevant Co, Hyde Park, Boston, Mass. Bulletin No. 456, spiral-bound, 24 pages, gives the range of company's work in the power apparatus field throughout this country and abroad by reproducing a series of advertisements describing typical installations made by Sturtevant. List of products includes air-conditioning equipment, suspended speed heaters, centrifugal fans, air washers, etc.

90 ELECTRIC HEATING UNITS — Westinghouse Electric & Mfg Co, Dept 7-N-20, East Pittsburgh, Pa. 40-page catalog 28-000 describes electric heating units and controls for industrial application involving the heating of liquids, solids or air.

91 UNIT HEATERS — Industrial Unit Heater Assn, 5-208 General Motors Bldg, Detroit, Mich. 12-page booklet "Standard Code for Testing Hot Water Unit Heaters" establishes standard test-

INSANE OPERATION! you are Guilty—

If you permit the following conditions:



Capacities to 100000# per hour
Pressures 125# p.s.i. to 500# p.s.i.
Suitable for firing with stokers, pulverizers, oil, gas, bagasse, hogged fuel or waste heat.

(Manufactured in Canada by Canadian Vickers, Ltd., Montreal)

1 **NEGLECT** to blow soot twice a day.
Keeler C.P. boilers have built-in soot blowers.

2 **NEGLECT** to treat your feed water.
Scale on tubes and plates prevents good heat absorption. C.P. Boilers are easy to keep clean.

3 **NEGLECT** to blow down at proper intervals.
Too little or too much is equally bad. Too little is dangerous. Too much is wasteful. Consult a feed water specialist.

4 **NEGLECT** to analyze the flue gases.
Anything less than 12% CO_2 in flue gases indicates poor operation. A CO_2 recorder is a paying investment. High CO_2 can be carried in C.P. boilers because the furnace walls are water cooled and will not melt down.

5 **NEGLECT** to keep boiler settings air-tight.
Keeler C.P. boilers are steel cased and insulated. This prevents cold air from leaking in and heat from leaking out.

6 **NEGLECT** to properly control the draft.
Too much is as bad as too little. A draft gauge is a paying investment.

7 **NEGLECT** to have your boilers insured.
Periodic inspections by licensed boiler inspectors will avoid costly repairs which migh be necessary due to undetected deterioration.

E. KEELER CO., WILLIAMSPORT, PENNA.

Send copy of Bulletin F9-2 to

NAME .....

TITLE .....

FIRM .....

ADDRESS .....

E. KEELER CO.
EST. 1864
WILLIAMSPORT, PENNA.

ing methods to assure uniform practices throughout industry.

92 UNIT HEATERS—D J Murray Co, Wausau, Wis. Bulletin 30d-11 describes the CI series of Grid high-test cast-iron unit heaters. Booklet also includes hookup diagrams, capacity tables and smoke bomb test photographs.

INSULATION

93 INSULATION—Baldwin-Hill Co, 575 Klagg Ave., Trenton, N. J. 16-page catalog discusses Baldwin-Hill insulations for industry and shows typical application photographs. Among the types of insulation discussed are rockwool blanket, pipe covering, insulating cement, koldboard and weatherseal.

94 INSULATING MAGNESIA — Ehret Magnesia Mfg Co, Valley Forge, Pa. File No. 37b discusses physical properties and insulating characteristics of various heat-insulating materials, featuring Ehret's 85% Magnesia. Gives insulating and physical characteristics as well as dimensions and packaging information on various shapes, sizes and forms.

95 MINERAL WOOL — Industrial Mineral Wool Institute, 441 Lexington Ave, New York, N. Y. 8-page book entitled "Specification for Mineral Wool in Low Temperature Applications" features 12 perspective drawings illustrating approved methods of applying mineral wool insulation, providing the necessary vapor barrier, supporting and finishing off the insulation in various applications.

96 CAULKING COMPOUND — Johns-Manville, 22 East 40th St, New York, N. Y. 4-page folder features Duxseal, all-purpose sealing and caulking compound, for sealing duct openings, filling multi-wire contact boxes, protecting battery terminals, and hundreds of other miscellaneous uses.

97 RESISTANCE MATERIAL — Keystone Carbon Co, St. Marys, Pa. 4-page folder discusses negative-coefficient resistance material developed to compensate for resistance changes caused by temperature variations, to reduce or eliminate initial current surge in electrical equipment, etc.

98 INSULATION—Quigley Co, Inc, 56 West 45th St, New York, N. Y. Bulletin No. 327-F, 8 pages, covers Insulag, a refractory plastic insulating lagging for use on high- or low-temperature equipment. Photographs illustrate uses of product in petroleum industry, metallurgical furnaces, and power plants.

LUBRICATING EQUIPMENT

99 LUBRICATION — Fiske Brothers Refining Co, Newark, N. J. 12-page catalog No. 2-41 describes company's service to machinery manufacturers that assures proper lubrication of machines in use and contains comments from typical users.

100 LUBRICATING EQUIPMENT — Gray Co, Inc, Minneapolis, Minn. 20-page book discusses Graco industrial lubricating equipment for heavy-duty service for fleet, contractor, factory, airport, railroad and industrial use. Lubricant pumps, hand guns, hose, meters and accessories described and illustrated.

101 OIL PURIFICATION — Honan-Crane Corp, 200 Superior St, Lebanon, Ind. 81 page publication entitled "On Land and On Sea" furnishes data on oil-purification installation in industry. Contents cover diesel engines, turbines, hydro-electric generators, and a wide range of industrial uses such as hydraulic presses, transformers, cutting and grinding machines, etc.

102 LUBRICATING SYSTEM — Trabon Engrg Corp, 1814 East 40th St, Cleveland, Ohio. 4-page folder describes the Trabon single-pipe centralized system that lubricates all connected bearings without employing any springs, diaphragms, packing or exposed moving parts.

103 CLARIFYING SYSTEM—Gale Oil Separator Co Inc, Chrysler Bldg, New York, N. Y. 4-page folder describes continuous circulating, intercepting and clarifying treatment system for cutting oils and coolants. Piping diagram shows how system works in clarification.

104 LUBRICANTS — Fiske Brothers Refining Co, Newark, N. J. 4-page folder outlines Lubriplate No. 130-A (heavy) and No. 126-AA (light) for steel-mill bearings, exposed gears, slides, wire rope and other equipment.

105 PURIFIERS—Honan-Crane Corp, Lebanon, Ind. 8-page catalog, No. 100 M, discusses continuous oil purifiers for gas and diesel industrial engines, having a capacity for handling lubricating oil of engines from 30- to 5000-hp. Complete details of operation and mechanical specifications are given along with illustrations of the equipment.

106 LUBRICATION—Sun Oil Co, 1608 Walnut St, Philadelphia, Pa. 16-page book entitled "Helping Industry Help America" contains case histories which show how engineering service in applying petroleum products in metal working, general lubrication, processing, mining, textile manufacturing and other operations is increasing American production.

107 COLLOIDAL GRAPHITE — National Graphite Co, 17 John St, New York, N. Y. Bulletin discusses the problem of graphiting light fuels and tells how Konag, a natural colloidal graphite, is used for lubricating purposes. Several types of this product outlined and their uses fully described.

108 AUTOMATIC CLARIFIER — Honan-Crane Corp, 500 Indianapolis Ave, Lebanon, Ind. 4-page folder presents a new high-flow-automatic oil clarifier for purifying honing and grinding oils or coolants used in large quantities in war production plants.

109 LUBRICATORS — Oil-Rite Corp, 332 W Wisconsin Ave, Milwaukee, Wis. 4-page leaflet presents constant-level lubricators for maintaining an accurate, constant and positive level of oil in ring, ball and roller bearings. Includes diagrams, features and specifications of company's lubricator line.

110 LUBRICANTS—Master Lubricants Co, Meadow and Jackson Sts, Philadelphia, Pa. 6-page pocket-size folder discusses Lubriko grease, said to have high melting point and low cold test. Lubricant is available in 14 grades for ball and roller bearing lubrication and for general-purpose sleeve bearing lubrication.

111 INDUSTRIAL OILS — Honan-Crane Corp, Lebanon, Ind. Bulletin No. 54 discusses the application of oil purification to industrial oils which include cutting oil, insulating oil, roller backup bearing oils, hydraulic oils, honing oils, compressor and fuel oils.

112 LUBRICATION—SKF Industries, Inc, Front St and Erie Ave, Philadelphia, Pa. 32-page book contains designs, formulas, and graphs which explain highly-technical text. Among subjects treated are functions of lubrication, oil lubrication, recommended viscosities, oil-supply systems and circulating systems. Book contains many diagrams and charts.

113 OIL PURIFIER — Honan-Crane Corp, 500 Indianapolis Ave, Lebanon, Ind. Bulletin 303 gives complete details of application and technical data on performance of Honan-Crane continuous oil purifier in purification of turbine and hydroelectric generator oil.

114 FUEL-OIL TREATMENT — Xzit Sales Co, 1031 Clinton St, Hoboken, N. J. Pocket-sized 4-page leaflet covers Xzit fuel oil treatment, non-explosive liquid that aids in handling, storage and burning fuel oils. Helps solve two main fuel oil problems: (1) the presence of water, and (2) the use of cracked residue as fuel.

MAINTENANCE

115 RESURFACING COMPOUND — Central Paint & Varnish Works, 63-69 Prospect St, Brooklyn, N. Y. Leaflet describes Lev-L-Flor, a synthetic product with a resilient finish that can be used on wood, concrete and other surfaces. Product is ready mixed and ready for use in repairing, resurfacing, water-proofing, and patching.

116 FLOOR COATING—Flexrock Co, 2377-B Manning St, Philadelphia, Pa. Literature describes Colorflex Plus, dust-proof floor preservative that imparts a dye-like coloring which uses the floor itself for wear resistance. Is said not to peel or crack, good for interior or exterior use over wood or concrete.

117 MAINTENANCE — Oakite Products, Inc, 22 Thames St, New York, N. Y. Digest describes 28 maintenance jobs in connection with prime movers, electrical equipment, compressors, air-conditioning and miscellaneous plant equipment, each outlined, giving material and method used, time saved and other advantages gained.

118 WATERPROOFING — Medusa Portland Cement Co, 1000 Midland Bldg, Cleveland, Ohio. Booklet entitled "How to Waterproof Concrete, Stucco and Masonry" explains how lack of waterproofing causes damage in buildings. Covers various waterproofing methods and advantages of integral waterproofing and gives specification for waterproofing concrete and stucco.

119 RESURFACER — Flexrock Co, 23rd & Manning St, Philadelphia, Pa. 4-page folder introduces Floor Patch, an instant-use resurfacer, for patching ruts and holes without mixing, waiting or tying up traffic.

All literature designated with a star (★) may be obtained only by writing directly to the manufacturer on company letterhead, giving writer's name and title.

★ SPRAY PAINTING—Binks Mfg Co, 3114-40 Carroll Ave, Chicago, Ill. Catalog No. 80 emphasizes part of spray painting and finishing in war production with special reference to spray-painting installations, paint circulating systems, spray booths of both dry and water-wash types, exhaust systems, and automatic spray finishing equipment for the coating of bombs and shells.

120 MAINTENANCE—Johns-Manville, 22 East 40th St, New York, N. Y. 8-page book, Form PP-9A, outlines in tabular form many hints on lengthening life of packings, insulations, roofings, friction materials, and refractory products. The manual also contains a summary of good installation and maintenance practices, providing a handy guide for maintenance engineers.

121 QUICK PATCH CEMENT — Smooth-On Mfg Co, Dept 306, 570 Communipaw Ave, Jersey City, N. J. Booklet introduces new product for quick patching of cracks, ruts, and shallow holes in concrete floors. Patches said to harden overnight, permit full traffic the following morning and become stronger with age.

122 FLOOR MAINTENANCE—Flexrock Co, 23rd & Manning Sts, Philadelphia, Pa. 4-page folder, "Tough Floors with Ruggedwear," tells how to cover rough concrete or wood floors, how to make feather-edge patches, etc. Each operation is clearly planned and photographically illustrated.

MATERIALS HANDLING

123 MATERIALS HANDLING — The American Pulley Co, Philadelphia, Pa. 20-page catalog, T-41, covers American pressed-steel hand trucks and wheels, as well as other materials handling equipment. Includes general utility trucks, bag trucks, warehouse trucks, railroad trucks, stevedore trucks, and special trucks.

124 MATERIALS HANDLING—Robins Conveying Belt Co, Passaic, N. J. Spiral-bound bulletin No. 115 describes Gyrex, a general-purpose positive-stroke vibrating screen. Each of the four elements making up a Gyrex screen is placed on a transparent insert on succeeding pages, giving the effect of one photograph. This highlights the features of the screen in a novel way. Also includes many dimensional tables and installation photographs.

125 MATERIALS HANDLING—Cleveland Crane & Engrg Co, Wickliffe, Ohio. 12-page booklet No. 2008-A, entitled "Cleveland Tramrail Engineering and Application Data" describes line of overhead materials handling equipment. Also contains diagrams and photographs illustrating flexibility of the equipment.

GENERAL GR REGULATOR

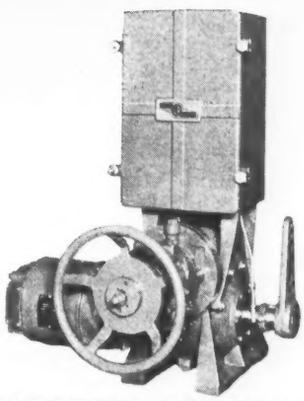
UTMOST DEPENDABILITY ACCOUNTS FOR EVER-WIDENING ACCEPTANCE IN POWER SERVICES

Designed and built to achieve the utmost in dependability and reliability, GR All-Electric Combustion Control is being adopted as standard in many leading plants and especially in those large utility plants where uninterrupted performance is of prime importance.

The dependability of GR Control is in large measure due to the fact that it is all-electric in operation and therefore not dependent on outside or auxiliary power supply. Group control coordination is obtained by the exclusive GR electric master loading system.

ADAPTABLE TO MANY POWER SERVICES

GR all-electric control systems center around a basic regulating unit that is easily adapted to meet control requirements involving pressure, speed, volume, or temperature. They are widely used for controlling the operation of dampers, inlet vanes, turbine steam valves, desuperheaters, super heater by-pass dampers, etc. In addition to combustion control applications these standard regulators are suited to many other applications where powerful and accurate control is necessary and definite assurance of utmost dependability in performance is required.

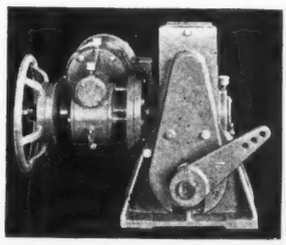


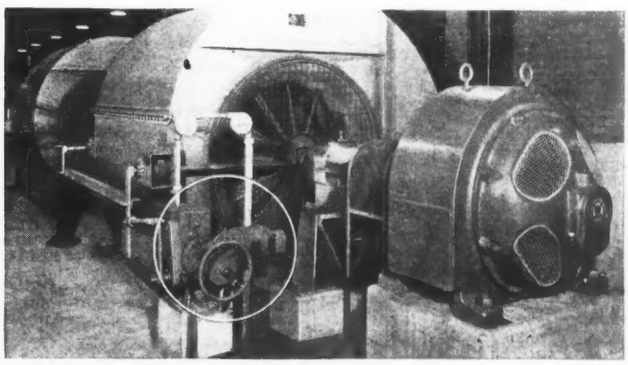
ELECTRIC GENERAL REGULATORS

Individually powered by motor designed for intermittent high torque control service. All regulators are self-locking on power failure. Manual control instantly available.

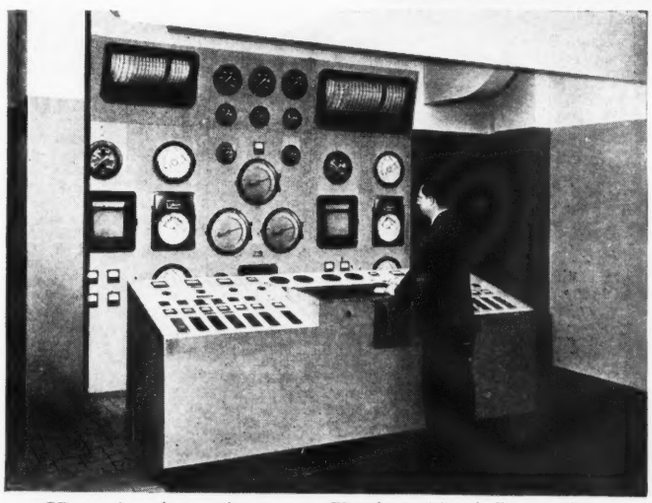
G R MOTORIZED ACTUATORS

For utmost dependability in remote manual control. Available in seven sizes and with power arms delivering from 50 to 1800 foot pounds torque. Remote panel operation by push button.



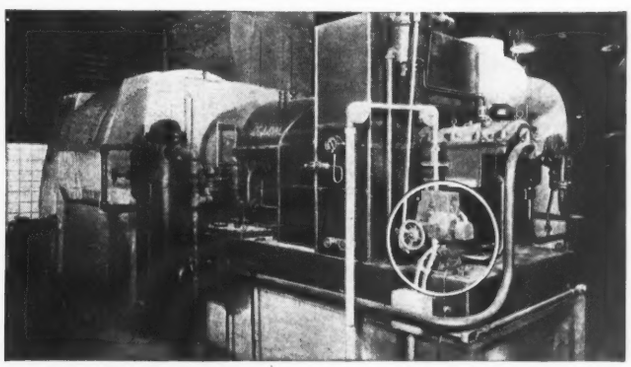


Inlet Vane Control of Forced Draft Fans



GR panel equipment is compact. Electric position indicators show percentage of regulator travel whether on automatic or manual operation.

ASK US . . . to give you a list of GR installations in your vicinity so that you may investigate their dependable performance. Outline your problem and let our control engineers help you solve it.



Two such turbine driven induced draft fans installed for a 750,000 lb. per hour steam generator.
Motorized actuator shown operating turbine governor mechanism. Regulator is remote from actuator location.

GENERAL REGULATOR CORPORATION
165 Broadway, New York, N. Y.

126 VIBRATING SCREENS—Robins Conveying Belt Co, Passaic, N. J. Bulletin No. 118 presents style "M" Vibrex screen which handles stone, gravel, sand, coal, and other bulk materials. Folder states that the new machine saves users money on installation, power, lubrication, screen cloth and maintenance.

127 LIFT-TRUCKS—Barrett-Cravens Co, 3262 West 30th St, Chicago, Ill. 4-page folder announces PowerOx, electrically operated lift truck, which combines standard line of multiple-stroke lift trucks with an electric power drive. Contains illustrations and specifications.

128 MATERIALS HANDLING—Chain Belt Co, Milwaukee, Wis. 16-page bulletin No. 410 discusses Rex belt idlers, apron conveyors, and bucket elevators, their advantages, features, types, sizes, and applications. Photographs show actual equipment installations.

129 TRAVELING CRANES—Reading Chain Block Corp, Reading, Pa. 16-page catalog A-42 discusses traveling cranes and unit parts such as trolleys, end trucks, gears and cabs. On-the-job photographs show specific installations.

130 MATERIALS HANDLING—Robins Conveying Belt Co, Passaic, N. J. 12-page bulletin No. 122 features line of Vibrex vibrating screens for materials handling. Photographs, diagrams, line drawings and tables illustrate construction and dimensions of types M and J.

131 MATERIALS HANDLING—Barrett-Cravens Co, 3255 W 30th St, Chicago, Ill. Catalog No. 501, 160 pages, contains over 400 illustrations of materials handling equipment including lift-trucks and skids, portable elevators and cranes, barrel and drum storage racks and two- and four-wheel trucks. All described and specified.

132 HOISTS—Coffing Hoist Co, Danville, Ill. 12-page catalog No. G-6 contains information, specifications and prices on company's complete line of hoists, trolleys, binders and utility maintenance tools.

134 CHAIN-TYPE CONVEYOR—Richards-Wilcox Mfg Co, Aurora, Ill. 36-page catalog A-78 illustrates typical installations of new chain-type conveyor system and gives brief data to show conditions under which application can be made, description of chain and drive and section drawing.

135 MATERIALS HANDLING—Robins Conveying Belt Co, Passaic, N. J. Bulletin No. 123 covers vibrating screens for liquids, with photographs, diagrams, and tables; shows typical examples of actual applications of Robins liquid screens in reclaimed-rubber, chemical, metallurgical, and food industries.

136 ELECTRIC HOIST—Wright Mfg Division, American Chain and Cable Co, Inc, York, Pa. 12-page booklet explains Wright "Speedway" hoist, low-cost electric hoist designed for fast lifting in machine shops, assembly floors. Photographs, cross-sectional diagrams, charts and tables of prices and specifications also furnished.

137 CONVEYOR—Link-Belt Co, 307 North Michigan Ave, Chicago, Ill. 32-page catalog and data book No. 2075 announces two new sizes of Bulk-Flo elevator-conveyor. Book contains diagrams showing paths of operation, gives a list of materials that can be handled and includes illustrated case studies with tables of sizes, capacities, dimensions, etc.

METAL HOSE & TUBING

138 METAL HOSE—Eclipse Aviation Div, Bendix Aviation Corp, Philadelphia, Pa. Bulletin H-201—1935 describes Eclipse seamless flexible metal hose with automotive, aviation, marine, manufacturing, plastics, textile, mining and power-generation applications. Photographs, diagrams and tables of miscellaneous data included.

METALS & METAL SPRAY

139 METAL CLEANING—Detroit Rex Products Co, 13005 Hillview Ave, Detroit, Mich. Illustrated leaflet describes methods used to solve industrial metal-cleaning problems. Also shows research, engineering and manufacturing facilities for production of degreasers, washers and chemical cleaners.

140 CASTINGS — Hammond Brass Works, Hammond, Ind. Data book contains standard specifications, applications and other related information. Also gives complete chemical analyses and physical properties of bronzes and alloys, along with microphotos to show the various metallurgical structures.

141 METAL SPRAY—Metallizing Engineering Co Inc, 21-07 41st Avenue, Long Island City, N. Y. 16-page bulletin No. 42A describes the metallizing process and equipment for its application. Tells briefly how essential industries are eliminating replacements and increasing service life of equipment now difficult to replace.

142 METALLIZING — Metallizing Co of America, 1330 West Congress St, Chicago, Ill. 20-page handbook discusses metallizing, what it is and what it does, and covers applications in aviation, transportation, foundries, power and railroad industries. Also includes photographs of equipment.

METERS AND INSTRUMENTS (not electrical)

143 INSTRUMENTS — Taylor Instrument Co's, Rochester, N. Y. Catalog No. 76 JF, 24 pages, lists the bourdon spring, bellows and manometer instruments for indicating, recording and controlling pressures. Also contains information on gage, differential and absolute pressure and vacuums.

144 INSTRUMENTS — Cambridge Instrument Co, Inc, 3732 Grand Central Terminal, New York, N. Y. 4-page leaflet features descriptions of industrial models of analyzers, indicators and recorders. Discusses recording gas analyzers, together with pH meters and other equipment for making precise measurements. Invites inquiries on instrument problems.

145 RECORDING THERMOMETERS —Bristol Co, Waterbury, Conn. 6-page folder, No. T302, discusses company's line of fully-compensated liquid-filled recording thermometers for temperatures between —125 F and 400 F. Also gives detailed information on construction and application of thermometers and various forms in which they are furnished.

146 PRESSURE INDICATORS—Bacharach Industrial Instrument Co, 7000 Bennett St, Pittsburgh, Pa. 4-page bulletin 283 features Premax direct-reading engine-pressure indicator for measuring compression and firing pressures on every type of diesel in the stationary, marine, automotive and aviation fields. Also contains photographs and cross-sectional diagrams.

147 INSTRUMENTS—Leeds & Northrup, 4934 Stenton Ave, Philadelphia, Pa. 16-page book entitled "Modern Precision" contains news of L&N instruments, controls and heat-treating methods and the job they are doing in industry, in research laboratories, in teaching and testing.

148 INSTRUMENTS—Wheelco Instruments Co, 863 West Harrison St, Chicago, Ill. 16-page bulletin No. Z6000 describes and illustrates company's complete line of measuring and control instruments. Also lists prices and numbers of catalog sections for reference when full information is required on any item.

149 OIL-BURNING SYSTEM — Peabody Engineering Corp, 580 Fifth Ave, New York, N. Y. 4-page bulletin No. 107 presents the cd (constant differential) system of control for mechanical atomizers with diagrams and application photographs.

150 FLOW INDICATORS—S F Bowser & Co Inc, Fort Wayne, Indiana. 8-page circular entitled "Flow Indicating Devices" shows what goes on in the pipeline. Shows devices for clear or opaque liquids, for vertical or horizontal installations, in adjustable or non-adjustable flow types with photographs, diagrams and specifications.

151 GAGES—Brown Instrument Co, Philadelphia, Pa. Bulletin No. 7011 contains specifications of Brown absolute-pressure gage with forms and models available, and gives advantages and outstanding features of instrument through exterior and interior photographs.

152 PYROMETERS—Wheelco Instrument Co, Harrison and Peoria Sts, Chicago, Ill. Defense Bulletin No. 1 aids instrument users in both defense and non-defense industries to gain maximum life and efficiency from pyrometric equipment now installed and being installed. Also suggests substitute materials and compares properties of the original and substitute materials.

153 GAGE TESTER—Star Brass Mfg Co, 108-114 East Dedham St, Boston, Mass. Bulletin A-14-154, 4 pages, features the new Star Brass high-pressure dead-weight tester in four types—single range, high pressure, with and without reservoir, and double range with and without reservoir. Diagrams show principles of operation and design details.

154 CO_2 ANALYZER—Bacharach Industrial Instrument Co, 7000 Bennett St, Pittsburgh, Pa. Bulletin 338, 4 pages, describes application and use of Fyrite CO_2 analyzer with photographs, diagrams and charts.

155 SPEED RECORDERS — Leeds & Northrup Co, 4934 Stenton Ave, Philadelphia, Pa. Catalog N-27, 12 pages, describes Micromax speed recorders which measure and automatically record speed of rotating machinery. Also covers Micromax speed charts which help management study past performance and set up operating schedules.

156 TACHOMETER—James G Biddle Co, 1211-13 Arch St, Philadelphia, Pa. 4-page folder, bulletin 1710, describes Jones heavy-duty hand tachometer for measuring speed directly in rpm or fpm. Instrument is made in both single and triple-range models for speeds from 200 to 2000 rpm.

157 SMOKE INDICATORS — Brooks Engineering Co, Inc, 4517 Wayne Ave, Philadelphia, Pa. 4-page bulletin No. 11 illustrates electric-eye smoke indicators and recorders with photographs and diagrams. Covers design advantages, construction, lubrication and dimensions.

158 PYROMETERS — Brown Instrument Co, Wayne & Roberts Aves, Philadelphia, Pa. 40-page bulletin, No. 1105, features design and operating features of Brown potentiometer pyrometer and accessory equipment. Also describes automatic control systems and explains their operation.

159 GAGES—Certified Gauge & Instrument Corp, 34-18 Northern Blvd, Long Island City, N. Y. 12-page book presents new line of Certified pressure, vacuum and compound gages with photographs and diagrams. Also contains table of pressure equivalents.

160 PRESSURE RECORDER — Foxboro Co, Foxboro, Mass. 32-page catalog 22-A describes instruments for measuring and recording all industrial pressures, in ranges from 1 in. water to 20,000 psi. Also contains list of standard ranges with full-size reproductions of specimen charts. Other sections cover methods of instrument mounting, cases available, integral electric signal systems, and necessary equipment.

161 GAGES — General Electric Co, Schenectady, N. Y. 8-page booklet (GEA-3673) describes available electric gages for measuring mechanical strains and lists examples of stress investigations that can be made. Among these are the determination of stresses on structural parts; housings of rolling mills, beams of shovels and cranes.

162 RECORDING EQUIPMENT — Leeds & Northrup Co, 4934 Stenton Ave, Philadelphia, Pa. 16-page revised catalog describes improvements in Micromax CO_2 recording equipment. Also contains full-size reproductions of round and strip-chart records and illustrations of installations.

162A WATER COLUMNS — Yarnall-Waring Co, Chestnut Hill, Philadelphia, Pa. 20-page revised bulletin WG-1809, illustrates construction details of Yarway water columns, try-cocks and water-level gages with photographs and diagrams. Other features include a table of dimensions and prices, a spare or repair parts list and typical installation photographs.

163 GAGES — Manning, Maxwell & Moore Inc, Bridgeport, Conn. 1942 general gage catalog, 64 pages lists numerous new gages, streamlined gage cases,

ENLIST NOW

in the battle against power-waste!

● *Power-waste* becomes *productive-power* when the Gilmer National Power-Recovery Plan goes to work in your plant. It gives you useful Power-Recovery Estimators... practical power-saving charts for each of these services: Electricity, Steam, Water, Gas, Mechanical Transmission, Compressed Air, Refrigeration, Boilers, and Prime Movers. Put them to work—today!

The Gilmer Plan was designed especially to build up Industry's power resources through systematic reduction of power wastes. Into it has been knitted the expert knowledge of leading power engineers, the Plan is completely practical and workable.

Do you know for sure that your boiler room is working at top efficiency? Isn't it possible that you could cut electricity consumption, and still keep things humming at full speed? *Don't take chances with the Nation's precious power!* Line up with the Gilmer National Power-Recovery Plan . . . *NOW!* All in one convenient booklet, it's yours for the asking, without cost or obligation.

L. H. GILMER CO., Tacony, Philadelphia, Pa.

The Oldest Firm of Rubber Fabric Belt Specialists

USE WHAT YOU LOSE

Gilmer BELTS

If your problem is belts...

The Gilmer Handy Belt Selector is designed to help you choose the correct Gilmer Belt for any purpose. Use it when selecting V-Belts, Flat Belting, Round Endless Belts, Belts for Textile Machinery, and many special purpose belts... for added efficiency and an aid to power-recovery. Write for this handy Gilmer Chart—it's free on request.

L. H. GILMER CO.
Tacony, Phila., Pa.

Gentlemen:

Please send me, without cost or obligation:

☐ The Gilmer National Power-Recovery Plan
☐ The Gilmer Handy Belt Selector

NAME & TITLE_____

COMPANY_____

ADDRESS_____

gages for special services and Dura-gages. Also illustrates testers and numerous accessories required by gage users.

164 INSTRUMENTS—Meriam Co, 1955 W 112th St, Cleveland, Ohio. 8-page catalog No. C-10 discusses company's line of manometers, draft gages, flowmeters, mercury-pressure gages, tank gages for measuring pressures, vacuums and flows of liquids and gases with illustrations and descriptions of equipment, suggestions for use, size ranges, dimensions, weights and list prices.

165 SPEED INDICATOR — Reeves Pulley Co, Columbus, Ind. 4-page bulletin No. G-427 features new electric remote-speed indicator for use with Reeves variable speed control equipment. Typical installation photographs show several methods of mounting these instruments.

166 METERS—Republic Flow Meters Co, 2222 Diversey Parkway, Chicago, Ill. 16-page catalog describes and illustrates complete line of company's equipment, including meters for measuring flow, pressure, level and temperature of steam, water, gas, air and oil, CO_2 meters, pneumatic remote measurement and control systems; regulators, automatic combustion control.

167 TEMPERATURE REGULATORS —Sarco Co, Inc, 475 Fifth Avenue, New York, N. Y. Bulletin No. 600, 16 pages, covers Sarco self-operated temperature regulator for water heaters and industrial applications. Gives specifications, dimensions, list prices and shipping weights of each regulator described.

168 MANOMETER — Simplex Valve & Meter Co, 68th & Upland Sts, Philadelphia, Pa. Bulletin No. 200 presents type MAC portable unit and MAP Simplex manometers for measurement of water, steam, boiler feed, and industrial liquids in power and process industries. Also includes specifications, capacities, and method of connection, and reference section of manometer data.

169 TACHOMETER—Herman H Sticht Co, Inc, 27 Park Place, New York, N. Y. Describes model J centrifugal hand tachometer whose operating mechanism is entirely on ball and oiless bearings. A wheel disk for reading surface speeds directly in fpm comes with instrument.

170 INSTRUMENTS—C J Tagliabue Mfg Co, Park & Nostrand Aves, Brooklyn, N. Y. 20-page catalog No. 1100B gives descriptions of regular line of precision and standard thermometers, hydrometers, and includes comparison scale graduations, corrections for immersion stems, and instructions for using hydrometers.

171 INDICATOR—Trill Indicator Co, P O Box 5757, Pittsburgh, Pa. Leaflet No. T-421 gives complete descriptions of outside-spring indicator and auxiliary attachments which are used on Liberty ships and are applicable for stationary steam engine service.

172 SMOKE RECORDING EQUIPMENT—Leeds & Northrup Co, 4934 Stenton Avenue, Philadelphia, Pa. Catalog N-93-163, 16 pages, illustrated with many installation pictures, tells how operators can tell smoke trend by referring to a chart on which smoke density is recorded. Also points out that signal lamps can be used to flash warning when stack smokes excessively.

173 PYROMETERS—C J Tagliabue Mfg Co, Park & Nostrand Aves, Brooklyn, N. Y. 36-page catalog No. 1101 F outlines Celectray, photocell, electric and light-ray pyrometers with high-speed photoelectric action. A wide variety of Celectray applications shown.

174 FLOWMETERS—Leeds & Northrup Co, 4934 Stenton Ave, Philadelphia, Pa. Catalog N-28-160, 20 pages, discusses Centrimax flowmeter for steam and water, which integrates directly and records rate of flow continuously.

175 PYROMETERS — Brown Instrument Co, Wayne & Roberts Aves, Philadelphia, Pa. 24-page catalog 15E covers millivoltmeter pyrometers, subdivided into four general classes: indicators, recorders, controllers and safeguards, employed singly or in combination. Contains many photographs.

176 THERMOMETERS — Brown Instrument Co, Philadelphia, Pa. 32-page catalog No. 9004, covers resistance thermometers for indicating, recording and controlling temperatures to a high degree of accuracy. Pictures thermometers, singly and installed in groups. Also contains many charts and diagrams.

177 CO_2 INDICATOR—Bacharach Industrial instrument Co, 7000 Bonnett St, Pittsburgh, Pa. Bulletin 337 discusses Fyrite CO_2 indicator which permits analysis in 30 seconds, is spillproof in any position and is also cold-weather proof. Also includes comments of typical users.

178 RECORDERS—Leeds & Northrup Co, 4934 Stenton Ave, Philadelphia, Pa. 28-page catalog, N-58-161, describes recording Instruments for telemetering and totalizing electric-power loads and discusses the use of load recorders by isolated utility and industrial power plants as well as better-known applications in system load dispatching. Contains many photographs and diagrams.

179 CONDUCTIVITY MEASUREMENT — Industrial Instruments Inc, 156 Culver Ave, Jersey City, N. J. describes Solu-Bridge, conductivity apparatus for boiler water and condensate, which offers a method for determining carryover in steam, purity of distilled water, leakage of contaminating liquids into steam condensate return lines and boiler water concentration.

180 INSTRUMENTS — Foxboro Co, Foxboro, Mass. Catalog 95-A, 48 pages, covers company's complete line of instruments for measurement and control of industrial process conditions. Six of book's ten sections group and describe all instruments and accessories appropriate to particular applications.

MOTORS

181 MOTOR CARE — Allis-Chalmers Mfg Co, Milwaukee, Wis. New handbook entitled, "A Guide to Wartime Care of Electric Motors" meets pressing problem of how to keep motors running under continuous service conditions. Taking a fresh slant on care of motors under war conditions, the book should prove of value to engineers and maintenance men and in training new operators. The handbook is an impartial study of all motor types.

182 STARTERS — Allen-Bradley Co, 1311 S First St, Milwaukee, Wis. 16-page catalog discusses factors that enter into selection of automatic reduced voltage starters for squirrel-cage motors. Bulletin also describes automatic resistance starters.

183 MOTOR-GENERATOR UNITS — Kato Engineering Co, Mankato, Minn. Form 1241 features Katolight plants in 7500, 10,000, and 15,000; 1200 and 1800 rpm which can be furnished either self-excited or with separate exciter attached. Also furnishes cross-sectional diagram, photograph and specification table.

184 INDUSTRIAL BRUSHES—Keystone Carbon, Inc, St Marys, Pa. 24-page catalog price list K-15 of industrial brushes for slip rings, motors, generators and metal graphite and carbon products furnishes specifications for all products illustrated.

185 MOTORS—Allis-Chalmers Mfg Co, Milwaukee, Wis. 12-page book, B6052-C, describes construction features of various Allis-Chalmers Lo-Maintenance motors and illustrates numerous typical applications. Motor manual also includes speed-torque curves, and discusses several phases of motor application, such as recommended use of higher speed motors and adjustable speed.

186 CARBON BRUSHES — Carbone Corp, Boonton, N. J. 6-page folder, bulletin 942, gives number of useful references, including application table, brush definitions, standard shunt connections, and detailed specifications of frequently used grades.

187 MOTOR-GENERATOR SET — Burke Electric Co, Erie, Pa. 4-page leaflet describes high-cycle motor-generator set, designed and developed to furnish high-frequency power with voltage characteristics for driving high-cycle tools.

188 MOTORS—General Electric Co., Schenectady, N. Y. Bulletin (GEG-1017) discusses the following subjects: (1) how to get the most out of old and new motors; (2) switching motors from one job to another, and (3) equipping old machines with new motors. Catalog also covers selection and application of motors, types of motor enclosures, ratings of standard integral horsepower motors and motor maintenance.

PAINTS & COATINGS

189 PAINT—The Arco Co, Cleveland, Ohio. 16-page book describes the advantages of Infray paint for use in industrial plants. This paint blends into the color scheme of the surrounding terrain and has a rather dull surface to insure not giving a reflection of moonlight or sunlight. Also gives specifications as used on buildings, storage tanks.

190 PAINT—Medusa Products Co, 1000 Midland Bldg, Cleveland, Ohio. 8-page booklet contains information on the painting of concrete, stucco and masonry, telling why a special paint is needed for these surfaces and how to paint them. Also furnishes typical application photographs.

191 RUST-PREVENTING PAINT — Rust-Oleum Paint Corp, 2425 Oakton St, Evanston, Ill. 20-page catalog contains directions for proper application of rust-preventive coatings. Photographs illustrate variety of products available, and explain where and how these materials may be used to insure maximum protection.

PIPING AND FITTINGS

192 RETURN SYSTEM — Cochrane Corp, 17th and Allegheny Avenue, Philadelphia, Pa. 4-page bulletin, Publ 3025, lists fifty industries using the new Cochrane-Becker high-pressure condensate return system. Also includes a 4-color illustration of a typical installation showing steam, condensate, and makeup lines. Detailed engineering specifications cover the technical features of design.

193 CONDUIT SYSTEM—Ric-wil Co, 1562 Union Commerce Bldg, Cleveland, Ohio. 12-page catalog "S" shows typical conduit fittings, pipe supports, glands, and pre-fabricated expansion loops complete with engineering details. Suggested specifications are included as well as tables of conduit capacities and required trench dimensions for each diameter unit.

194 STRAINERS—Yarnall-Waring Co, Chestnut Hill, Philadelphia, Pa. 4-page bulletin S-200 lists three improved features of Yarway fine-screen strainer, (1) inside and outside plating for protection against rusting, (2) special Monel woven wire screen, and (3) straight thread and machined face on blow-off bushing for easy removal and replacement of screen and for tight joint.

195 UNDERGROUND STEAM SYSTEMS — Ric-wil Co, Cleveland, Ohio. Spiral-bound Bulletin No. 420-A, furnishes engineering data on underground steam systems for defense needs, compiled from field experience. Some adaptations of Ric-wil insulated pipe units to solve wartime problems are shown in many typical layouts and specifications. Tables of engineering information, charts, graphs, and installation diagrams are included.

196 EXPANSION JOINTS—American District Steam Co, North Tonawanda, N. Y. 14-page bulletin No. 35-15B gives details of construction, dimensions, specifications, etc, of the Adsco piston-ring type, model A expansion joints, made in sizes from 2-20" for all pressures up to 400 lb.

197 PIPE BENDER—Atlas Pipe Bender Corp, 141 E 25th St, New York, N. Y. 8-page leaflet describes the new fully-automatic Atlas pipe bender, series A, for general use wherever pipe must be bent economically. Photograph shows principles of operation.

198 PIPE FRICTION CHART — De Laval Steam Turbine Co, Trenton, N. J. Chart determines the pressure drop accompanying the flow of air or gas through pipes of known diameter and length. An auxiliary alignment chart simplifies the calculation for systems containing piping of various diameters.

199 VALVES—The Foxboro Co, Foxboro, Mass. 6-page folder describes Stabilflo valves. Photographs,

Guard YOUR turbines with this oil that's

FIGHTING with the FLAT-TOPS

FROM THE LAND "DOWN UNDER" to the fog-bound north the mighty turbines in scores of U. S. Naval units are being lubricated by new, rust-preventive Shell Turbo Oil.

These turbines run under a wide variety of loads. The oil, which is constantly in contact with air and, frequently, water, must lubricate bearings, gears, governor. It's one of the toughest turbine lubrication assignments there is. But new, rust-preventive Shell Turbo Oil can handle it.

The secret is in the fact that it has *all* 3 vital requirements necessary to the proper lubrication of modern turbines:

RUST PREVENTION
SUPERIOR OXIDATION STABILITY
MINIMUM FOAMING TENDENCY

Call in the Shell man now. Let him show you why it will pay you to use the new Shell Turbo Oil.

RUST-PREVENTIVE

SHELL TURBO OIL

A name to Remember

OIL IS *Ammunition* - USE IT WISELY

SHELL

charts and diagrams point out features, such as integral bonnet, guided plunger, wide-range, equal-percentage V-port plunger and Stabilflo motor which has floating power.

200 EXPANSION JOINTS — Joseph Kopperman & Sons, 312-16 New St, Philadelphia, Pa. Catalog No. 61, 16 pages, outlines Kopperman packless copper expansion joints with mechanical and technical data on installations. Also lists many features not previously available in a packless expansion joint.

201 VALVES—R-S Products Corp, 4530 Germantown Avenue, Philadelphia, Pa. 16-page catalog No. 10-B features standard and special butterfly valves for control and tight shutoff of air, gas, steam, liquids and semi-solids under high and sub-zero temperatures and varying pressures from 2 to 300 psi. Also contains performance characteristics under service conditions.

202 PIPE-JOINT COMPOUND — X-Pando Corp, 43-15 36th St, Long Island City, N. Y. Pocket-size circular, 6 pages, discusses X-Pando, pipe-joint compound that expands slightly after setting. Also lists typical users.

203 FITTINGS—Hetherington & Berner Inc, 701-745 Kentucky Ave, Indianapolis, Ind. 6-page folder, (S-12), describes company's steam jacketed pipe and fittings and illustrates several practical applications with photographs. Also includes diagrams of eight fittings.

204 STEAM TRAPS—Yarnall-Waring Co, Chestnut Hill, Philadelphia, Pa. 16-page bulletin E-1737 outlines Yarway impulse steam traps with operating principles, construction details, typical installations, additional applications, installation and operating suggestions, capacities and prices, weights and dimensions.

205 FLEXIBLE PIPING — Pennsylvania Flexible Metallic Tubing Co, 72nd St and Powers Lane, Philadelphia, Pa. 8-page bulletin 71 furnishes 1942 standard data for Penflex, all-metal flexible pipes for diesel installations, exhaust pipes, air intakes and supply lines.

206 STEAM TRAPS—Sarco Co, Inc, 475 Fifth Ave, New York, N. Y. 8-page bulletin No. 450 covers company's line of floating thermostatic steam traps, compressed-air traps, and liquid-level controls. Photographs, diagrams, descriptions, and list prices are included for each instrument described.

207 STEAM TRAPS—Yarnall-Waring Co, Chestnut Hill, Philadelphia, Pa. 16-page bulletin T-1736 gives complete information regarding construction features, operating principles, installation and operating suggestions, capacities, prices, weights and dimensions of Yarway traps. Typical installation pictures and customer testimonials are shown.

208 SWIVELS—Trabon Engrg Corp, Cleveland, Ohio. Engineering bulletin No. 424 describes straight and angle swivels for making oil, grease, air and other line connections between stationary or oscillating surfaces, with photographs, diagrams and dimension tables.

209 PIPE BENDING—Tal's Prestal Bender Inc, Milwaukee, Wis. 4-page booklet introduces Tal's Prestal, a portable hydraulic bending machine which is said to produce smooth, even bends on iron and steel bar and pipe in one simple operation. Photographs show machine parts and method of use.

210 BENDING MACHINES — American Pipe Bending Machine Co, 37 Pearl St, Boston, Mass. 4-page folder covers the American Victory line of pipe, conduit and tube bending machines with typical photographs, sizes and dimensions.

211 PIPE FITTINGS—Bonney Forge & Tool Works, Allentown, Pa. 16-page bulletin WT-31 tells how to make branch pipe outlets with Bonney Weldolets, Thredolets and socket-end Weldolets. Book also contains illustrations of various types of installations, showing adaptability to manufactured goods and pre-fabricated piping with complete tables of specifications and dimensions.

212 PIPE BENDING—A M Byers Co, Pittsburgh, Pa. 4-page folder contains chart on proper pipe-bending practice, "Helpful Hints on Pipe Bending" and mentions the service bulletin "The Bending and Flanging of Wrought-Iron Pipe."

PUMPS

213 PUMPS — Blackmer Pump Co, Grand Rapids, Mich. 24-page general catalog gives background of company's pump line and presents data concerning applications in petroleum, chemical, paint, food industries, in the marine field and in other industries. Also lists typical users.

214 PUMPS—Allis-Chalmers Mfg Co, Milwaukee, Wis. 36-page bulletin, B6018-B, furnishes engineering data on Electrifugal and SSUnit pumps. Contains head capacity and dimension charts for selection of proper pumps for individual applications and many photographs and diagrams illustrating complete pump line.

215 PUMPS—Chain Belt Co, Milwaukee, Wis. 24-page bulletin No. 404 features Rex Pumpcrete, that pumps concrete, with complete specifications and dimensions for all size machines. Booklet also tells how to operate and set up Pumpcrete system.

216 PUMPS—De Laval Steam Turbine Co, Trenton, N. J. Leaflet entitled "Relation of Suction Head to Capacity with Hot Water Pumps" shows how performance of a pump handling hot water at various temperatures may be correctly deduced from the characteristic curves of the same pump when handling cold water at corresponding suction lifts.

217 PUMPS—Downingtown Mfg Co, Huber Pump Div, Downingtown, Pa. 6-page folder introduces pump operating on what the company calls the "squeegee" principle, and illustrates it with many photographs and diagrams.

218 PUMPS—Goulds Pumps, Inc, Dept 57, Seneca Falls, N. Y. 18-page booklet "Pump Fundamentals" with pump application data sheets containing both elementary and advanced technical data on selection, installation, operation and maintenance of all industrial pump types for general and specialized services.

219 PUMPS — Worthington Pump & Machinery Corp, Harrison, N. J. Bulletin W-111-B31, 4 pages, features Worthington horizontal single-piston pumps. Also contains capacities, specifications and dimensions.

220 PUMPS — Blackmer Pump Co, Grand Rapids, Mich. 6-page folder, bulletin No. 302, contains comprehensive tables of friction losses in pipes, covering viscosities to 2400 SSU, valves and fittings, viscosity conversion tables, tables of practical suction lifts and other data for those interested in pumps and piping layouts.

221 PUMPS—Higgins Industries, Inc, 521 City Park Avenue, New Orleans, La. 4-page folder announces Higgins turbine pump now available to industry after application on company's boats. Table of capacities at various heads and hp, photographs of pump, and other engineering data included.

222 PUMPS—Ingersoll-Rand Co, Phillipsburg, N. J. 12-page 2-color bulletin contains photographs and cross-sectional views, extensive performance tables, of class GT 2-stage centrifugal pumps and tabulation showing friction of water in various sizes of pipe. Many practical applications cited.

223 PUMPS—Lawrence Machine and Pump Corp, 371 Market St, Lawrence, Mass. 4-page folder discusses nonclogging sewage and sludge pumps and their application in handling of sludge in industrial and chemical plants where it is necessary to pump liquids containing various solid and fibrous material in suspension. Also contains photographs and cross-sectional diagrams.

224 PUMPS—Milton Roy Pumps, 1300 E Mermaid Ave, Philadelphia, Pa. Bulletin No. 426 explains how Step-Valve used in Milton Roy pumps is designed for specific purposes, and how it functions in pumping against pressures up to 20,000 lb psi. Illustrations show typical valve designs and why double-ball checks used in Step-Valve construction are claimed to be non-clogging and self-cleaning.

225 PUMPS—Pennsylvania Pump & Compressor Co, Easton, Pa. 20-page bulletin No. 238 covers Thrustfre multistage centrifugal pumps in the 4-, 5-, 6- and 7-stage series. Pump design said to reduce substantially number of parts subject to wear and replacement.

226 PUMPS—Worthington Pump and Machinery Corp, Harrison, N. J. 8-page bulletin W-350-B6 outlines Worthite pumps for handling hot brine slurries and oil-field brines. Worthite is high-alloy-complex steel recommended for this particular application.

226A LIQUID HANDLING—S F Bowser, Fort Wayne, Ind. 40-page industrial equipment catalog covers the field of liquid handling and control by describing equipment for filtration and distillation, lubrication, metering, pumping, storage and dispensing of liquids.

227 PUMPS—Viking Pump Co, Cedar Falls, Iowa. 20-page pocket-size service manual contains suggestions and instructions for pump maintenance. Parts are described and illustrated and hints are given on care of each section.

228 PUMPS—Chain Belt Co, Milwaukee, Wis. Bulletin 400, 24 pages, discusses Rex Speed Prime pumps made in capacities from 3000 gph to 125,000 gph, their features, and specifications concerning pump design and manufacture. Also contains information on how to pick a pump for a specific job.

229 PUMPS—Quimby Pump Co, 340 Thomas St, Newark, N. J. 10-page stationary instruction manual contains information on installation, operation and maintenance of Quimby pumps under the heading "Cues to Better Pumping Practice". This information is applicable to other types of pumps as well.

230 CENTRIFUGAL PUMPS—Worthington Pump & Machinery Co, Harrison, N. J. 4-page bulletin, W-312-B2C, features single-stage volute, type L, in capacities to 2000 gpm, heads to 300 feet. Photographs, tables, and diagrams show standard features, specifications, dimensions, capacities, heads and speeds.

231 PUMPS — U. S. Stoneware Co, Akron, Ohio. 4-page bulletin features centrifugal acid pumps for all hot or cold corrosive solutions. Booklet contains characteristic performance curves as well as photographs and diagrams which give complete specifications.

232 PUMPS — Blackmer Pump Co, Grand Rapids, Mich. 4-page folder features Blackmer direct-connected rotary pump with capacities of 5-10-20-gpm, furnished in all standard drives for many uses. Principle of operation and important mechanical features described and illustrated. Also includes tables of specifications.

233 CENTRIFUGAL PUMPS — Allis-Chalmers Mfg Co, Milwaukee, Wis. 8-page booklet B6059-H contains concise descriptions, charts, diagrams, construction features, sizes and capacities of centrifugal pumps which simplifies the choice of proper pumping equipment for specific needs.

234 PUMPS—De Laval Steam Turbine Co, Trenton, N. J. 12-page catalog B-3 describes two-stage centrifugal pumps of the opposed impeller design with photographs, cross-sectional diagrams, tables of dimensions and heads and deliveries at standard motor speeds.

234A PUMPS—Blackmer Pump Co, Grand Rapids, Mich. 6-page leaflet presents entire company line of marine rotary pumps, including methods of mounting, accessories, and strainers for use with the pumps. Also covers hydraulic balance of pumps and diagram of operating cycle.

REFRACTORIES

235 CERAMICS — American Lava Corp, Chattanooga, Tenn. 12-page reprint from Electronic Engineering is entitled "The Electrical Properties of High-Frequency Ceramics". Many charts, photographs and diagrams contain data not hitherto published.

236 FIRE BRICK—Mexico Refractories Co, Mexico, Mo. 28-page booklet covers Mono-Fibrik plastic fire brick, its advantages, methods of installation, application in lining hrt and watertube boilers, and all types of industrial and metallurgical furnaces.

237 REFRACTORY CONCRETE—Atlas Lumnite Cement Co, Chrysler Bldg, New York, N. Y. 24-page book features characteristics of Lumnite, methods of making refractory concrete,

HERE'S QUICKER DRYING FOR YOU

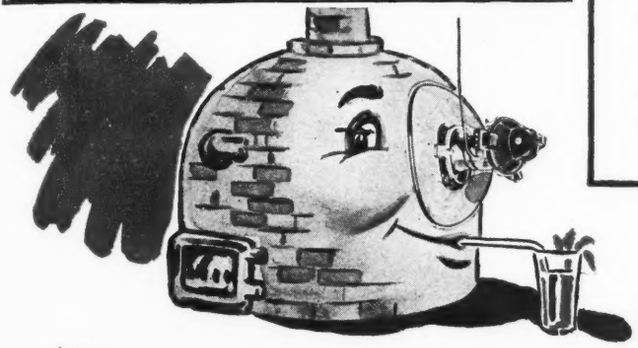
Put a Coppus Blower to work on those sheets you've just treated with coating material. It will dry them quickly — save a lot of time for you. Ideal for drying processes involving paints, lacquers, lumber, brick, pottery, enameling, etc. You'll know by the "Blue Ribbon" this blower is precision-engineered for dependable service.

COPPUS

DOES HEAT MAKE THEM "TEN-PERCENTERS?"

Working in a temperature of 110° F., men are only 10% efficient. Installing Coppus Heat Killers solves this problem. They pour a constant stream of invigorating air on the workers in a hot place — give them "pep" enough to keep working without heat-exhaustion. The Coppus "Blue Ribbon" means this blower is built *to last* — and gives no trouble.

COPPUS



COOL OFF WITH A COPPUS

Coppus Boiler Manhole Blowers and Exhausters save time cooling off and ventilating boilers, furnaces, kilns, retorts, cracking stills, coke ovens, etc. Easily hooked up by one person. The blue band (The Coppus "Blue Ribbon") means extra years of service.

COPPUS

1001 USES

Two general types of Coppus Blowers and Exhausters — one for high velocities of air, the other for large volumes — have been modified many times for special purposes. Check off the applications which fit your needs, and have us send you specific information and prices.

PLEASE SEND ME INFORMATION ON

Supplying Fresh Air to Men Working:

- ☐ in tanks, tank cars, drums, etc.
- ☐ in underground cable manholes.
- ☐ on coke ovens.
- ☐ on steam-heated rubber processes.
- ☐ around cracking stills.
- ☐ on boiler repair jobs.

COOLING:

- ☐ motors, generators, switchboards.
- ☐ wires and sheets.
- ☐ general man cooling.
- ☐ supplying fresh air to storage tanks on tank farms.
- ☐ exhausting welding fumes.
- ☐ stirring up stagnant air wherever men are working or material is drying.
- ☐ drying of walls, sheets, etc., after treated with coating material.

(Write below any special ventilating problem you may have.)

NAME.....

COMPANY.....

ADDRESS.....

CITY.....

MAIL THIS COUPON

To Coppus Engineering Corp., 333 Park Avenue, Worcester, Mass. Sales offices listed in THOMAS' REGISTER. Other "Blue Ribbon" Products in SWEET'S.

COPPUS "BLUE RIBBON" BLOWERS AND EXHAUSTERS

DESIGNED FOR YOUR INDUSTRY ... ENGINEERED FOR YOU

heat-resistant concrete and refractory-insulating concrete. Book contains many photographs and tables.

238 PLASTIC CEMENT—Botfield Refractories Co, Swanson and Clymer Sts, Philadelphia, Pa. 6-page folder illustrates Adachrome plastic supercement for bonding and surfacing of furnaces, incinerators, ovens, kilns, etc. Also mentions other company products.

239 REFRACTORY—A P Green Fire Brick Co, Mexico, Mo. 4-page folder tells how Greencote, refractory maintenance coating, helps operators get greater service from existing furnace linings. Photos show typical applications.

240 FURNACE INSPECTION DOOR —Gillette Kiln Sales Co, Pittsburgh, Pa. 4-page circular contains information on construction, operation details and installation of an inspection door which is applicable to various types of industrial furnaces, boilers and kilns under continual heats up to 2500 F.

241 INDUSTRIAL PRODUCTS — Johns-Manville, 22 East 40th St, New York, N. Y. 52-page book, GI-6A, contains recommendations on high- and low-temperature insulation for industrial needs from 400 F below zero to 2500 F above. Complete data also included on J-M refractory products and castables.

242 REFRACTORIES — General Refractories Co, Philadelphia, Pa. 72-page catalog lists all company refractory products available for non-ferrous and chemical industries as well as blast furnaces. Approximately half the book is devoted to tables on actual use of various types of brick, and other tables essential to refractory users.

243 REFRACTORIES — Mexico Refractories Co, Mexico, Mo. 8-page bulletin contains information on "Selection of Refractories to Meet Specific Service Conditions," for men in industry who are striving to achieve the ultimate in production to best further the war effort.

244 REFRACTORY COATING—Brickseal Refractory Co, 1029 Clinton St, Hoboken, N. J. 4-page folder features Brickseal refractory coating and illustrates methods of application. Brickseal has been used satisfactorily in marine and industrial boilers and is also used in heat-treating and metallurgical furnaces under all firing conditions.

REFRIGERATING EQUIPMENT

245 REFRIGERATION — Frick Co, Waynesboro, Pa. 16-page bulletin No. 100-C features, with photographs and diagrams, refrigerating machines for air conditioning, marine use, testing and research, cold-storage and process work.

246 QUENCH-OIL COOLER — The Trane Co, La Crosse, Wis. 4-page Bulletin S363 covers four basic systems for cooling quenching oil: evaporative cooler, shell-and-tube heat exchanger, mechanical refrigeration, and combination systems, each of which is diagramed.

STOKERS

247 STOKERS—American Engineering Co, Philadelphia, Pa. 8-page catalog discusses operation, advantages and applications of water-cooled Taylor stoker. Includes photographs and diagrams and lists representative installations.

248 STOKERS—Iron Fireman Mfg Co, Portland, Ore. 20-page bulletin features Iron Fireman Poweram heavy-duty stokers for boilers developing up to 400 hp; outlines features of these stokers, shows actual installation photographs and lists representative users.

249 STOKERS—Westinghouse Electric & Mfg Co, East Pittsburgh, Pa. 44-page booklet B-3039 describes continuous-ash-discharge stokers for central stations and industrial plants. Accurate construction, simplified control requirements, and installation economy among features listed. Photographs and line drawings illustrate combustion principles and typical installations.

SWITCHES, TRANSFORMERS AND CIRCUIT BREAKERS

250 AIR CIRCUIT BREAKERS — Roller-Smith Co, Bethlehem, Pa. 12-page catalog 2150 discusses type HD indoor air circuit breakers for use on ac circuits up to 600 v and dc circuits of 250 or 750 v. Also shows typical ways of making connections to large breakers, gives dimensions of both manual and electrical designs and indicates number and size of terminal for various capacity breakers.

251 TRANSFORMERS—General Electric Co, Schenectady, N. Y. 8-page folder GEA-3714 discusses air-cooled transformers insulated by air and solid dielectrics without cooling or insulating liquids, for distribution circuits above 600 volts. Also includes photographs and diagrams illustrating details of construction and care taken in selection and application.

252 ROTARY SWITCHES — Roller-Smith Co, Bethlehem, Pa. 16-page catalog, No. 7140, outlines rotary instrument, control, transfer and auxiliary switches. Instrument switches include ammeter, voltmeter, wattmeter, temperature-indicator units, etc. Control switches include those for circuit breaker, motor-governor speed and rheostat control. Diagrams of connections and switch developments shown for each switch listed.

253 SPEED TRANSMISSION — Ideal Commutator Dresser Co, Sycamore, Ill. 52-page handbook includes recommendations, application data, photos and engineering information on variable-speed pulleys, variable-speed transmissions, automatic tension control motor base. Also gives sizes, rated capacities, design and operating details, where applicable, how installed, etc.

254 TRANSFORMERS—United Transformer Co, 150 Varick St, New York, N. Y. Bulletin No. PS-405, 36 pages, presents complete line of transformers for broadcast, amateur, laboratory and replacement purposes. Photographs, diagrams, charts and tables describe specific transformers.

255 CIRCUIT ARRANGEMENTS — General Electric Co, Schenectady, N. Y. 8-page publication, GEA-3759, offers information to help in selection of proper arrangement of load-center distribution systems to fit individual requirements of industrial plants, shipyards, naval and military projects, etc. Bulletin also describes four basic load-center circuit arrangements.

256 OIL CIRCUIT BREAKERS — Roller-Smith Co, Bethlehem, Pa. 12-page catalog 3130 describes small oil circuit breakers designed for ac circuits in industrial plants and power houses. Also discusses various methods of tripping, describes attachments that can be supplied, gives characteristics of each size breaker and shows dimensions and typical control diagrams.

257 AIR CIRCUIT BREAKERS — General Electric Co, Schenectady, N. Y. 8-page catalog, GEA-2997B, features air circuit breakers for protection of resistance-welding machines up to 600 volts, ac, for installation as overcurrent protection and disconnecting means.

258 ELECTRIC SWITCHES—Federal Electric Products Co, Newark, N. J. 68-page catalog contains engineering information on safety switches, panelboards, circuit breakers, etc. Also includes typical installation photographs and data on allowable hp ratings, wiring data for motors, etc.

259 METAL CLAD SWITCHGEAR—Roller-Smith Co, Bethlehem, Pa. 12-page catalog 1110 points out advantages of metal-clad switchgear in safety, reliability and ease of installation. Construction details on the Roller-Smith design are described and illustrated. Also contains complete dimensional data on various gear types available.

TOOLS

260 LOCK NUTS—An-cor-lox Division, Laminated Shim Co Inc, 86 Union St, Glenbrook, Conn. 6-page folder is replete with diagrammatic, photographic and factual matter on An-cor-lox styles, materials, designs and finishes; application constructions; and suggestion for parts conversion to the An-cor-lox function.

261 PRECISION LATHES — South Bend Lathe Works, Dept 5P, South Bend, Indiana. Catalog No. 16, 8 pages, illustrates and describes 16-in. toolroom lathes and 16-in. quick-change gear lathes. Also lists attachments, accessories and tools for use with these lathes.

262 PIPE TOOLS—Beaver Pipe Tools, Inc, Warren, Ohio. 4-page condensed catalog on company's line of pipe tools is designed as a reference piece for jobbers' salesmen and covers the same material as general catalog.

263 VISE—Studebaker Machine Co, 9 South Clinton St, Chicago, Ill. 4-page folder introduces Drilvise, an automatic hydraulic vise for drill press work and other operations, with photographs, diagrams and specification table.

264 CUTTING AND THREADING—Beaver Pipe Tools, Inc, Warren, Ohio. 28-page 1942 catalog covers complete line of portable pipe and bolt, cutting and threading machines, power drives and power units, pipe reamers, vises, etc. Illustrates and details of each item given.

265 TOOLS—Black & Decker Mfg Co, Towson, Md. 56-page data book traces screw-head principle from Archimedes to present day with special emphasis on company's work in field of power assembly tools, including portable electric screw drivers, nut runners and tappers.

266 TURRET LATHE — South Bend Lathe Works, Dept 5P, South Bend, Ind. 4-page condensed catalog illustrates and describes South Bend No. 2-H Turret Lathe with complete specifications and construction features. New lathe is adaptable to long run or small lot production on wide range of bar, chucking or fixture jobs. Has capacity of 1⅝ in. through the spindle hole, 16 in. swing over the bed and saddle and 1 in. through the collet.

267 WIRE NUTS—Ideal Commutator Dresser Co, 1279 Park Ave, Sycamore, Ill. 4-page folder discusses Ideal Wire Nuts which save lead, tin and rubber as used in solder and tape joints. Nuts come in four sizes for joining all common combinations from two No. 18 to three No. 10—solid or stranded wires.

268 SOLDERING IRONS — Hexacon Electric Co, 161 W Clay Ave, Roselle Park, N. J. New circular describes Hexacon line of electric soldering irons, both screw and plug tip with illustrations of each.

269 TOOL BRAZING AND REPAIR—Handy & Harman, 82 Fulton Street, New York, N. Y. Bulletin tells how cutting tools can be salvaged by brazing with Easy-Flo. Photographs illustrate typical applications where war demands for high production cause more than usual breakage.

270 LATHES — South Bend Lathe Works, South Bend, Ind. 8-page bulletin No. 52 includes illustrations, basic dimensions, capacities, speeds and feeds of back-geared screw-cutting lathes, as well as attachments for tool-room and production work.

271 TOOLS—Studebaker Machine Co, 9 South Clinton St, Chicago, Ill. 6-page folder lists variety of mountings, construction, and features of a hydraulic visepress for production, tool room, and maintenance work. Also contains many photographs of these visepresses which are said to speed up vise work, cutting, testing, stamping, riveting, assembling, etc.

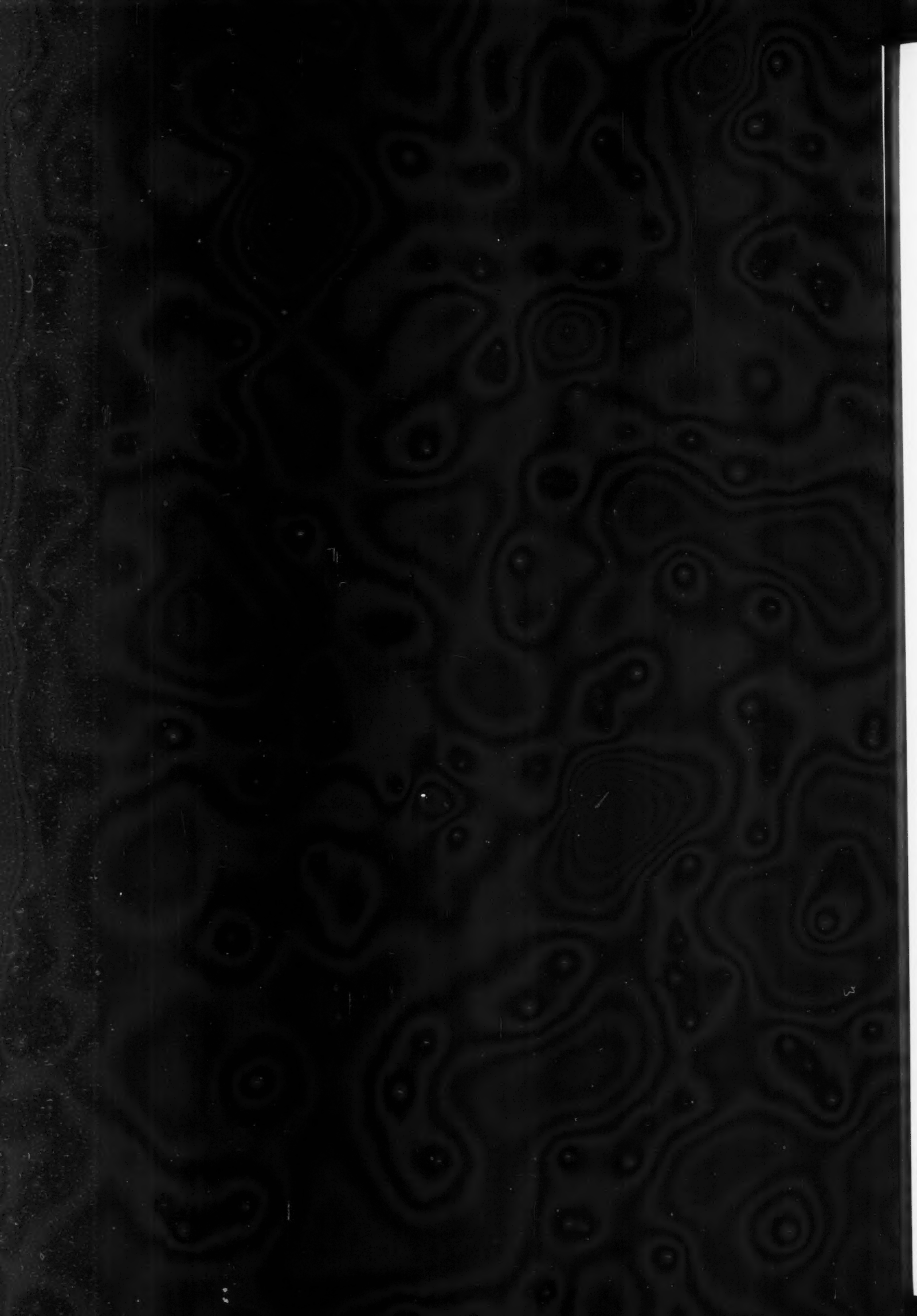
272 WRENCHES — Blackhawk Mfg. Co, Ind. Supply Div, Milwaukee, Wis. 48-page pocket-size booklet describes socket, box-type, specialty and torque-indicating wrenches, their uses and new features.

VALVES

273 VALVES—J S Coffin Jr, Co, Englewood, N. J. 4-page bulletin CV-1 outlines the Coffin control valve for regulation of boiler feed with line and cross-sectional diagrams. Typical application sketch included.

274 VALVES—Edward Valve & Mfg Co, East Chicago, Ind. 4-page catalog No. 12-G5 describes Edward Intex valves, integral-seat valves, for leak-proof performance in extreme temperature and pressure service in power plant and process piping systems. Many photographs, tables and diagrams point out

(Continued on page 136)



NEW CATALOGS, BOOKLETS, BULLETINS

Bring Your Equipment Library up to Date

For Your Convenience

Three reply cards are printed here as a part of this insert. On each is room to request four pieces of literature.

How to Order

1. If you are requesting four pieces or less, use the bottom card. For five to eight pieces, use two lower cards; for nine to twelve pieces, use all three cards.

2. Be sure to fill out completely one of the twelve spaces for each piece you order. This will assure your receiving copies of literature promptly.

3. When you have filled out completely one space for each catalog or bulletin you want, detach along the scored lines and drop the cards in the mail.

Example

Write in circle number of item describing one catalog wanted → (17)

Your Company Name Brown Mfg Co.

Address 3718 First Avenue

Pottsville, Okla.

Your Name John Smith

Your Title Power Engineer

POWER, 330 West 42nd St., New York

Important

Be sure that the number you write in a circle corresponds with the number of the item describing the piece of literature requested.

Please letter or write plainly and include full address.

These cards not good after March 1, 1943

Write in circle number of item describing one catalog wanted → ( )

Name.....

Address.....

.....

Company.....Title.....

POWER, 330 West 42nd St, New York 12-42

Write in circle number of item describing one catalog wanted → ( )

Name.....

Address.....

.....

Company.....Title.....

POWER, 330 West 42nd St, New York 12-42

Write in circle number of item describing one catalog wanted → ( )

Name.....

Address.....

.....

Company.....Title.....

POWER, 330 West 42nd St, New York 12-42

Write in circle number of item describing one catalog wanted → ( )

Name.....

Address.....

.....

Company.....Title.....

POWER, 330 West 42nd St, New York 12-42

Write in circle number of item describing one catalog wanted → ( )

Name.....

Address.....

.....

Company.....Title.....

POWER, 330 West 42nd St, New York 12-42

Write in circle number of item describing one catalog wanted → ( )

Name.....

Address.....

.....

Company.....Title.....

POWER, 330 West 42nd St, New York 12-42

Write in circle number of item describing one catalog wanted → ( )

Name.....

Address.....

.....

Company.....Title.....

POWER, 330 West 42nd St, New York 12-42

Write in circle number of item describing one catalog wanted → ( )

Name.....

Address.....

.....

Company.....Title.....

POWER, 330 West 42nd St, New York 12-42

Write in circle number of item describing one catalog wanted → ( )

Name.....

Address.....

.....

Company.....Title.....

POWER, 330 West 42nd St, New York 12-42

Write in circle number of item describing one catalog wanted → ( )

Name.....

Address.....

.....

Company.....Title.....

POWER, 330 West 42nd St, New York 12-42

Write in circle number of item describing one catalog wanted → ( )

Name.....

Address.....

.....

Company.....Title.....

POWER, 330 West 42nd St, New York 12-42

Write in circle number of item describing one catalog wanted → ( )

Name.....

Address.....

.....

Company.....Title.....

POWER, 330 West 42nd St, New York 12-42

features, dimensional details, and material specifications.

275 VALVES—Everlasting Valve Co, 49 Fisk St, Jersey City, N. J. 32-page bulletin E-100 describes valves for boilerroom service with tables of specifications, dimensions and prices. Illustrations show design and construction of various Everlasting valve types.

276 VALVES—Fairbanks Co, 397 Lafayette St, New York, N. Y. 6-page folder describes Faircoseal bronze valves having threadless portways with pre-inserted rings of silver brazing alloy.

277 VALVES—Frick Co, Waynesboro, Pa. 6-page folder, bulletin No. 191-A features Frick semi-steel valves and fittings for use with ammonia, Freon-12, methyl chloride, carbon dioxide, or other gases and liquids at normal or low temperatures. Photographs and diagrams illustrate these valves.

278 VALVES—Jenkins Bros, 80 White St, New York, N. Y. 16-page catalog covers stainless-steel valves in gate, globe-and-angle, lift-check, swing-check, and Y-valve types. Diagrams illustrate features of each valve described. Specifications also furnished.

FIRST CLASS
PERMIT No. 10
(Sec.510,P.L.&R.)
NEWYORK,N.Y.

BUSINESS REPLY CARD
NO POSTAGE STAMP NECESSARY IF MAILED IN THE UNITED STATES

4c. Postage Will Be Paid By—

POWER
330 West 42nd Street
New York, N. Y.

FIRST CLASS
PERMIT No. 10
(Sec.510,P.L.&R.)
NEWYORK,N.Y.

BUSINESS REPLY CARD
NO POSTAGE STAMP NECESSARY IF MAILED IN THE UNITED STATES

4c. Postage Will Be Paid By—

POWER
330 West 42nd Street
New York, N. Y.

FIRST CLASS
PERMIT No. 10
(Sec.510,P.L.&R.)
NEWYORK,N.Y.

BUSINESS REPLY CARD
NO POSTAGE STAMP NECESSARY IF MAILED IN THE UNITED STATES

4c. Postage Will Be Paid By—

POWER
330 West 42nd Street
New York, N. Y.

279 FLUSH VALVES—Imperial Brass Mfg Co, 1200 West Harrison St, Chicago, Ill. 16-page bulletin contains complete operating, adjusting and repair instructions for flush valves with drawings and cross-sectional views showing construction. Tells how to keep maintenance low, gives service data and lists parts.

280 VALVES—Everlasting Valve Co, 49 Fisk St, Jersey City, N. J. Bulletin E-52 B, 4 pages, covers weight-operated Everlasting valves with pendulum stop for fire protection. Illustrations show both opening and closing types with specifications.

281 VALVES—Edward Valve & Mfg Co, Inc, East Chicago, Ind. 56-page catalog No. 12 includes complete design, dimensional and metallurgical descriptions of cast-steel stop, check, and stop-check valves. Also describes Edward patented Impactor handwheels, throttlers, bypasses, etc.

282 VALVES — R-S Products Corp, Wayne Junction, Philadelphia, Pa. 4-page catalog No. 15-B describes precision-machined and wedge-tight cast-steel valves in 150-, 300-, and 600-lb sizes, with photographs, diagrams and tables of dimensions.

283 VALVES—Crane Co, 836 S Michigan Avenue, Chicago, Ill. 6-page bulletin No. 5, "How to Repair Valves", explains and illustrates steps to take in repairing leaky gate and globe valves with hints on how to reclaim discarded valves.

284 VALVES AND FITTINGS—Frick Co, Waynesboro, Pa. Bulletin No. 192-A, 4 pages, gives allowable working pressures for valves and fittings shown in catalog K. The use of stronger materials in making these valves and fittings allows them to be installed in systems handling high-pressure gases and liquids.

285 VALVES AND FITTINGS—Fairbanks Co, 393 Lafayette St, New York, N. Y. Catalog No. 42, 176 pages, illustrates and describes lines of bronze and iron valves and brass unions. Book also shows sectional views of valves, illustrations of various parts and prices, and contains many tables of valuable information.

WATER TREATMENT

287 WATER TREATMENT — American KAT Corp, 122 East 42nd St, New York, N. Y. 4-page issue of new house organ to be published periodically. This bulletin is said to carry the latest data, technical and current, pertaining to the use of company's water treatment for boilers, stills and evaporators.

288 WATER TREATMENT — American Water Softener Co, Lehigh Ave & 4th St, Philadelphia, Pa. 12-page bulletin (No. 101-B) describes a number of different types of equipment which answer problems of corrective chemical feeding for water refining. Bulletin serves as a guide for proper selection for individual applications.

289 FEEDWATER TREATMENT — The Bird-Archer Co, 400 Madison Ave, New York, N. Y. 4-page folder introduces Tanalginate, new protective and reactive colloidal material for conditioning boiler feedwater. Product is used in conjunction with such inorganic chemicals as phosphates or alkali.

290 WATER TREATMENT — Chain Belt Co, Milwaukee, Wis. 6-page folder describes, illustrates and gives technical information concerning Rex Slo-Mixers, which offer operators of sewage and water treatment plants the advantages of the Langlier process of multi-stage flocculation.

291 WATER TREATMENT — Graver Tank & Mfg Co, Inc, East Chicago, Ind. Bulletin No. 310 describes Graver chemical proportioneer, a new device providing accurate control of chemicals fed into the water-treating plant in proportion to the volume of water. Permits instant increase or reduction of chemical charge over wide range.

292 WATER TREATMENT — Oakite Products Inc, 22 Thames St, New York, N. Y. 24-page manual reviews methods for removing carbonizing oil, sludge, lime-scale and rust deposits from

(Continued on page 138)

Looking ahead with Asbestos

In the Power Plant of Tomorrow it will continue to be "standard equipment"

HE who predicts a lusty future for K&M "Featherweight" 85% Magnesia is playing safe, indeed.

In any "Tomorrow" visible from here, this great insulating material is bound to click. For many of the Nation's leading industries have already proved it to be as efficient an insulator as they've been able to find. Proved *and* attested! A fuel and heat conserver of unmatched thriftiness.

And not only thrifty but tough! Two years spent in a sunken ship did not impair its efficiency; nor could the Ohio River's muddy floods do it any harm.

When the demands of war relax and K&M "Featherweight" 85% Magnesia gets its honorable discharge, who can doubt that it will continue to get a tremendous peace-time play?

Meanwhile, a pledge and an invitation: We shall continue our researches in asbestos, seeking new uses for this gifted mineral; you in turn are urged to offer suggestions that might lead to asbestos helping you more.

* * *

Nature made asbestos;
Keasbey & Mattison, America's asbestos pioneer,
has made it serve mankind . . . since 1873.

KEASBEY & MATTISON
COMPANY, AMBLER, PENNSYLVANIA

Makers of

asbestos-cement shingles and wallboards; asbestos and magnesia insulations for pipes, boilers, furnaces; asbestos textiles; asbestos electrical materials; asbestos paper and millboard; asbestos marine insulations; asbestos acoustical materials; asbestos packings; asbestos corrugated sheathing and flat lumbers; asbestos-cement pipe for water mains

"MEGGER"

TRADE MARK REGISTERED U S PAT OFF

Insulation Testers, Ground Testers and Ohmmeters

Today's Events

are emphasizing the importance and the dependability of these world-famous testing instruments, for detecting and preventing trouble in electrical equipment.

We urge you to inform us as soon as possible of your requirements for "Megger" instruments.

Write for—(no charge):

Pocket Manual of "Megger" Practice No. 1420-P
Technical Bulletin on Ground Testing No. 1285-P
Ducter Ohmmeter (for quick measurements of very low resistance) Bulletin 1635-P

James G. Biddle Co.

1211-13 ARCH STREET *Electrical and Scientific Instruments* PHILADELPHIA, PA.

many different types of water-cooled or water-circulating equipment to maintain heat-transfer efficiency, with special emphasis on Oakite Compound No. 32.

293 WATER TREATMENT—Permutit Co, 330 West 42nd St, New York, N. Y. 12-page bulletin No. 2420 describes proportioning and non-proportioning devices to feeders of phosphate, sodium sulphite, sodium sulphate, and other supplementary chemicals to boilers.

294 FEEDWATER TREATMENT — Proportioneers, Inc, Providence, R. I. File No. 1100.26 contains general specifications for high- and low-pressure Adjusto-feeders with a capacity range from zero to maximum gpm against discharge pressures up to and including 2000 psi. Numerous photographs and diagrams show design details.

295 WATER TREATMENT — W A Taylor & Co, 7300 York Road, Baltimore, Md. Fifth edition of booklet entitled "Modern pH and Chlorine Control" discusses the meaning of pH control, methods, theory, applications and brief descriptions of company's line of equipment. Insert lists new prices effective January 1, 1942.

296 WATER TREATMENT—Technicraft Engrg Co, 5610 South Soto Street, Los Angeles, Cal. 8-page bulletin eatures Sterozone water purification without chemicals. Automatic operation filters, sterilizes, controls taste and odor. Many other features covered.

297 WATER TREATMENT—Wallace & Tiernan Co, Inc, Newark, N. J. 16-page leaflet entitled "Keep a 'Weather Eye' on Water Quality" cites fifteen actual cases where production problems were solved by microbiological quality control of process water.

298 WATER TREATMENT — Water Treatment Co of America, 1159 Hodgkiss St, Pittsburgh, Pa. 10-page booklet discusses the "Technical" water-conditioning system which provides power-plant and condenser-system operators with a closely supervised system for controlling water condition to prevent all forms of water damage and difficulty in operation. Includes diagrams and data on causes of boiler scale.

299 CHEMICAL FEEDERS — Wilson Chemical Feeders, Inc, Buffalo, N. Y. Well-illustrated bulletin covers "Pulsa-feeder" unit for injecting water-treating chemicals. Includes data on construction, uses, controls and application for wide range of jobs and chemicals.

300 WATER SOFTENERS — Worthington Pump and Mach Corp, Harrison, N. J. 6-page folder, W-212-B2, describes and illustrates Worthington hot-process water softeners with cross-sectional diagram and photographs.

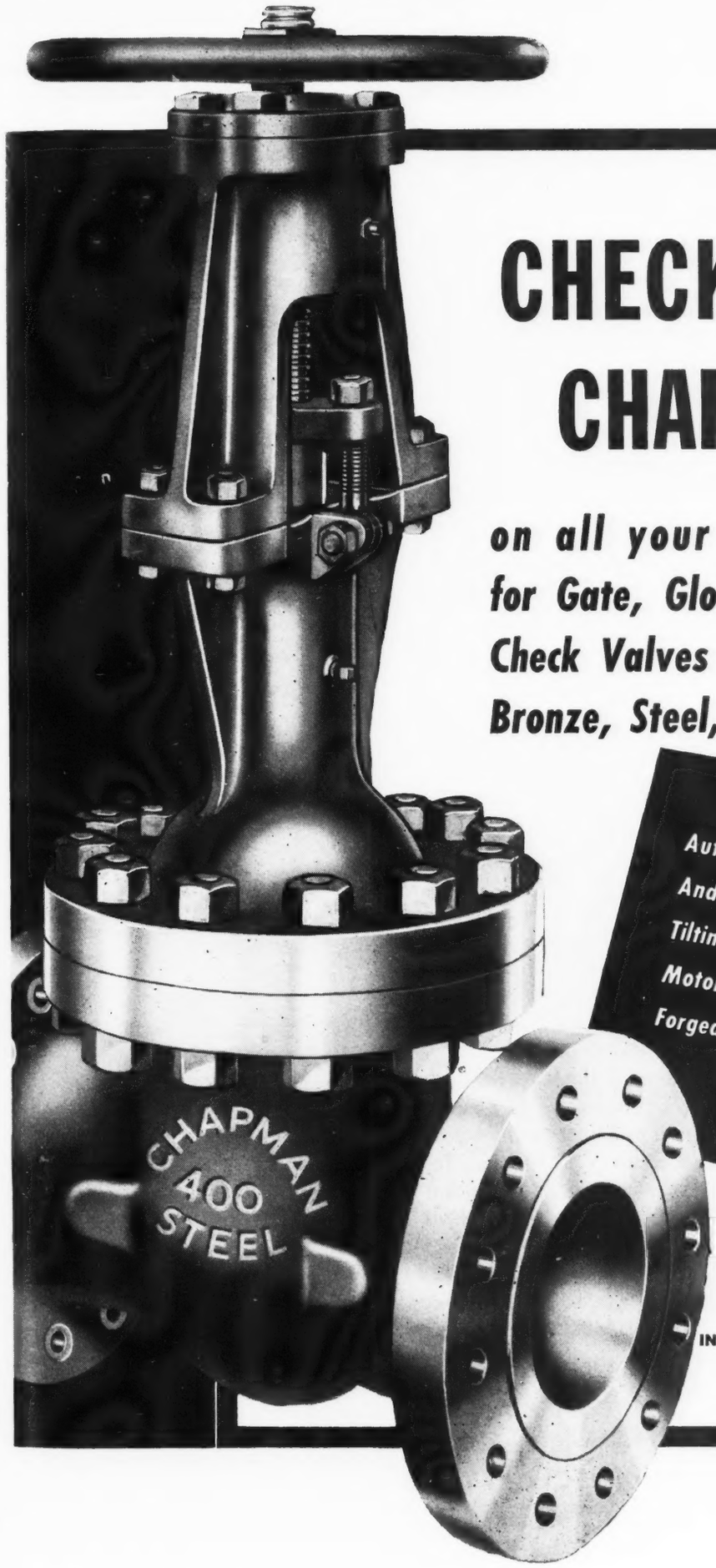
301 WATER TREATMENT—American Water Softener Co, Lehigh Ave and Fourth St, Philadelphia, Pa. 8-page bulletin describes two common processes for softening water, ie, base exchange, and lime and soda. Also includes actual installation photographs as well as typical cross-section of company's water softener.

302 WATER TESTING — The Bird-Archer Co, 400 Madison Ave, New York, N. Y. 20-page booklet contains concise information on water-testing equipment, method of making all control tests, conductivity apparatus, proportioning pumps, and chemical feeders.

303 WATER TREATMENT—Graver Tank & Mfg Co Inc, East Chicago, Ind. 12-page bulletin covers six methods of softening water with Graver zeolites. Also includes general information as well as practical applications of these water-treatment methods.

304 WATER TREATMENT — Water Treatment Co of America, 1159 Hodgkiss St, N S, Pittsburgh, Pa. 8-page booklet explains in semi-technical style the functions of "Baerite" formula in balancing waters which cause rust, scale, corrosion, foaming, priming and other boiler troubles.

305 WATER ANALYSIS—W H and L D Betz, Gillingham & Worth Sts, Philadelphia, Pa. 20-page illustrated booklet presents various apparatus and chemicals used for industrial water analyses for plant control. Book features tests required for determining hardness, alkalinity, phosphate, sulfate, pH value,



CHECK WITH CHAPMAN

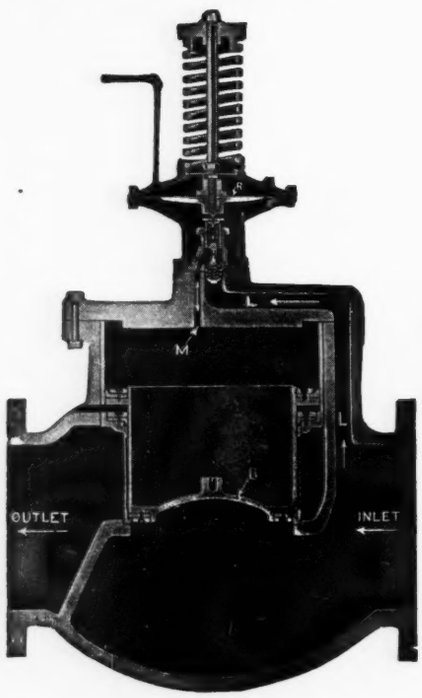
on all your requirements for Gate, Globe, Angle, and Check Valves of Iron, Brass, Bronze, Steel, Alloys

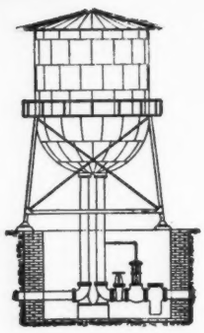
And Also for
Automatic Cone Valves
Anderson Coupling Brass Goods
Tilting Disc Non-Slam Check Valves
Motor Units for Valve-Control
Forged Steel Valves
Bar Stock Valves
Sluice Gates

ARMY E NAVY

The CHAPMAN VALVE
MANUFACTURING CO.
INDIAN ORCHARD, MASSACHUSETTS
Offices in Principal Cities

GOLDEN-ANDERSON SPECIALTY Valves





ALTITUDE CONTROL

• Hold efficiency at an even level by equipping your tank or stand-pipe with G-A Altitude control valves. You'll get a constant, automatic water level at all times, with no overflow. This valve is positive in action, with no water or hammer shock. Comes in sizes of 2" to 36", in either globe or angle pattern. Air and water cushioned, it also includes full bronze trim with no metal contacts. Write for your free copy of the G-A catalog . . . it completely describes the entire line.

also

Triple-acting non-return . . .
Pressure Reducing . . .
Throttle and Emergency
Stop . . . check valves, etc.

GOLDEN-ANDERSON VALVE SPECIALTY CO.
FULTON BUILDING • • • PITTSBURGH, PA.

and others. Numerous comparators, photometers, turbidimeters, etc, are displayed.

306 FEEDWATER TREATMENT — Elgin Softener Corp, 130 North Grove Ave, Elgin, Ill. Catalog No. 550, 8 pages, explains essential requirements of correct boiler-water treatment and tells how Elgin individually prepared treatment meets these requirements. Chemicals for treating hot, cold, and process water, condenser and cooling water, chemical feeders, and water testing equipment are also covered.

306A WATER TREATMENT—Graver Tank & Mfg Co, East Chicago, Ind. 4-page bulletin No. 312 describes Graver chemical tanks and proportioning equipment for water treatment with photographs, charts, diagrams and specification tables.

WELDING

307 WELDING—The Lincoln Electric Co, Cleveland, Ohio. 18-page bulletin, 432, compares the new "Fleet-Fillet" technique of arc welding with conventional methods as regards angle of electrode, weld penetration, weld strength, deposited metal and speed of welding, for both single and multiple-pass welds.

308 WELDING—Arcos Corp, 401 N Broad St, Philadelphia, Pa. Bulletin No. 5 contains tables showing current values, weld-metal characteristics, deposition data, heat treatment and applications of Arcos stainless and alloy electrodes.

309 WELDING — Cullen-Friestedt Co, Chicago, Ill. Bulletin WP 22, 16 pages, describes practice of welding on positioners and lists typical welding jobs with descriptions of position-welding methods.

310 WELDING—Lincoln Electric Co, Cleveland Ohio Bulletin 412 discusses the Lincoln "Shield-Arc", the welder with self-indicating dual continuous control for lower welding costs, wider welding range, and simplified operation. Many photographs illustrate the features of these arc welders.

311 WELDING ELECTRODES — Hobart Brothers Co, Box P-79, Troy, Ohio, revised 20-page handbook describes welding electrodes and accessories.

312 WELDING CHART — Lincoln Electric Co, Cleveland, Ohio, Wall chart, approx 17x23-in., illustrates weld characteristics for fillet welds and beads made with shileded arc electrode under various conditions.

313 WELDING—General Electric Co, Schenectady, N. Y. 32-page bulletin (GEA-2704B) presents complete line of arc-welding accessories. Among items specified and described are: goggles, shields, head protectors, protective clothing, welding screens, metal and carbon electrode holders, etc.

OTHER

313A CHAIN DRIVES—Link-Belt Co, 307 North Michigan Ave, Chicago, Ill. 6-page pocket-size folder No. 1951, entitled, "First Aid for Faithful Chain Drives" offers maintenance hints on chain drives when repair or replacement is impossible. Also contains seven suggestions to make any chain drive run better and last longer.

314 SAFETY—A Schrader's Son, 470 Vanderbilt Ave, Brooklyn, N. Y. 4-page pamphlet gives information on equipment which will reduce accidents through use of compressed air. The safety installations described are said to be easy to install and operate and to increase production.

315 GRAPHITE—United States Graphite Co, Saginaw, Mich. 12-page booklet tells the history of graphite, and describes applications such as feedwater treatment, electrotyping, pencil manufacture, and many uses in foundries and steel mills.

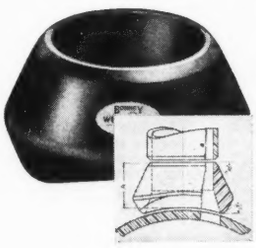
316 SHIMS—Laminated Shim Co, Inc, Glenbrook, Conn. 8-page booklet covers the history of the development of industrial and mechanical applications of laminated shims. Also describes use of these shims for fitting machine parts in the original assembly and making serv-

WELDOLETS · THREDOLETS

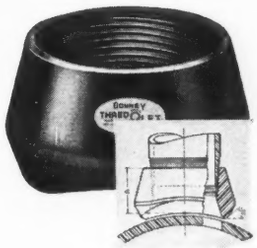
TRADE MARKS · REG. U. S. PAT. OFF.

Welded Outlets for Every Piping System

For Making Welded Right-Angle Branch Pipe Outlets Stronger, Better...At Less Cost



WELDOLET



THREDOLET

Socket-End WELDOLET

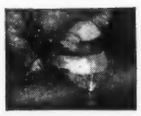
WELDOLETS, ThredOlets and Socket-End WeldOlets overcome every fault and weakness of 90° pipe-to-pipe welded junctions . . . common practice prior to their introduction.

They eliminate all templets . . . the necessity of cutting a symmetrical hole in the main pipe . . . shaping the end of the branch pipe to fit that hole . . . the sharp, right-angle turn which sets up stresses and weakens the junction . . . turbulence and friction, caused by the 90° turn, which restricts flow.

Because of their design they produce wide, funnel-shaped branch outlets. Their heavy, external rib compensates for loss of strength in the main pipe when the hole is cut . . . providing a 90° outlet of full pipe strength. This rib and the wide base eliminates the need for extra braces to take care of bending and vibrational stresses at the junction.

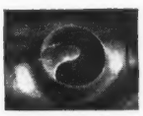
They have broad application in header construction and all power piping systems. Sizes up to 24" x 24".

Installed in 6 Easy Steps

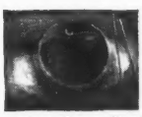


Select the position of the outlet. Mark center lines. Tack into position.

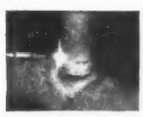
Weld to the main pipe, following and filling the bevel along the base of the fitting.



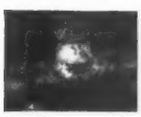
Remove the button with the torch, a hole saw or by drilling.



The inside of the joint is in full view for inspection, impossible with any other type of junction or fitting.



Then attach the branch pipe, by welding if a WeldOlet or Socket-End WeldOlet is used—or by screwing into place if a ThredOlet is used.

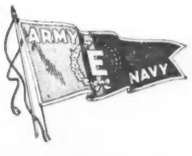


The job complete. A leakproof joint of full pipe strength has resulted without any forming or fitting of the main pipe.

Write for this book...It tells all

It tells in detail: what they are; how to reduce turbulence and friction; how they fill every need on new construction or maintenance; their adaptability to shop fabrication; complete tables of specifications and dimensions, as well as amplifying the information given above.

If you use or expect to use pipe fittings for welding, you need this book. Write for it today . . . Bulletin WT31.



BONNEY FORGE & TOOL WORKS — *FORGED FITTINGS DIVISION* — **ALLENTOWN, PA.**

Supervised Boiler and Condenser Cooling System Protection at Moderate Cost!

We believe the true answer to your boiler water and condenser cooling system problem lies in competent supervision of water conditions by experts plus a simplified natural method of water correction. Our new Technical System does just that! Scheduled supervision and treatment based on frequent water analysis finds and remedies your trouble . . . specific organic formulas developed individually to fit your needs provide a simplified, natural correction. Send the coupon below for the new Technical System bulletin or have a Water Treatment Company engineer inspect your plant without obligation.

WHY NOT SEND THIS COUPON *NOW*? . . . to

American Radiator & Standard Sanitary
New York CORPORATION Pittsburgh

Akron, Ohio · Canton, Ohio · Cleveland, Ohio
Columbus, Ohio · Erie, Pa. · Fort Wayne, Ind.
Lima, Ohio · Mansfield, Ohio · Springfield, Ohio
Toledo, Ohio · Wheeling, W. Va.

BAILEY-FARRELL COMPANY
Charleston, W. Va. · Huntington, W. Va.

MUTUAL SUPPLY CO., Cincinnati, Ohio

or send to

☐ Please send the new Technical System bulletin.
☐ Have a Water Treatment Company engineer call.

Name ..... Title .....

Company .....

Address .....

WATER TREATMENT COMPANY of America
1200 HODGKISS STREET · PITTSBURGH, PA.

ice adjustments. Testimonial letters from typical customers in many fields included.

All literature designated with a star (★) may be obtained only by writing directly to the manufacturer on company letterhead, giving writer's name and title.

★ WEIGHTS AND DATA—Revere Copper and Brass Inc, 230 Park Ave, New York, N. Y. Fourth edition of "Revere Weights and Data Handbook" includes conversion tables giving equivalents, weights and measures, metric and English, areas of circles and squares, weight conversion factors, and weights per lineal foot, of copper, brass and bronze products.

317 LIGHTING—Goodrich Electric Co, 4600 Belle Plaine Ave, Chicago, Ill. Pocket-size folder deals with the present urgent need for protective lighting around industrial plants. This folder illustrates various styles of porcelain enameled floodlights available to meet the demands for illumination in different locations. All equipment listed is in accordance with FBI specifications.

318 POWER TRANSMISSION—Power Transmission Council, Inc, 53-63 Park Row, New York, N. Y. 16-page booklet entitled, "Modern Mechanical Power Transmission for Industry" is nontechnical and attempts to show the necessity of really designing the drives in any plant and how to choose the proper drive for each job. Provision has been made for private companies to distribute this booklet, which covers the general field of mechanical transmission.

319 LEAD AND TIN PRODUCTS — Alpha Metal & Rolling Mills Inc, 363 Hudson Ave, Brooklyn, N. Y. 4-page folder entitled "Alpha Lead & Tin Products" includes lead-tin alloy tables and describes varying alloys-solders, extruded shapes, pipe and tubing and other specialties.

320 CONCRETE—Atlas Lumnite Cement Co, 135 East 42nd St, New York, N. Y. 16-page booklet describes Atlas Lumnite cement used in making concrete which has full working strength in less than 24 hours. Also points out that booklet is useful for industrial maintenance jobs and for maintaining rush construction schedules.

321 WROUGHT-IRON PRODUCTS—A M Byers Co, Pittsburgh, Pa. 61-page spiral-bound general catalog covers company's wrought iron, tubular and hot-rolled products, steel tubular products and alloy steels. Many photographs, diagrams and tables illustrate product features.

322 FIRE-EXTINGUISHING EQUIPMENT—Cardox Corp, Room 1715, 307 N Michigan Ave, Chicago, Ill. 9-page pamphlet describes results of four demonstrations showing effectiveness of fire-extinguishing methods developed by Cardox. Bulk, low temperature, low-pressure, liquid CO_2 used in these tests was shown to be effective in extinguishing large pool fires, and outdoor transformer compartment fires. Many photographs show steps, equipment and results.

323 STEEL SHAPES — Commercial Shearing and Stamping Co, Youngstown, Ohio. 16-page bulletin, Section No. 3, lists a number of standard steel shapes which can be purchased as production items, without tool or die charges. Also includes dimensions and drawings of the shapes described.

324 RUBBER — B F Goodrich Co, Akron, Ohio. 30-page guidebook lists application and properties of many products for industrial and aeronautical purposes using natural, synthetic or reclaimed rubber. Among eleven indexed sections are: properties of Ameripol, hydraulic equipment parts, extruded rubber goods, and properties of reclaimed rubber.

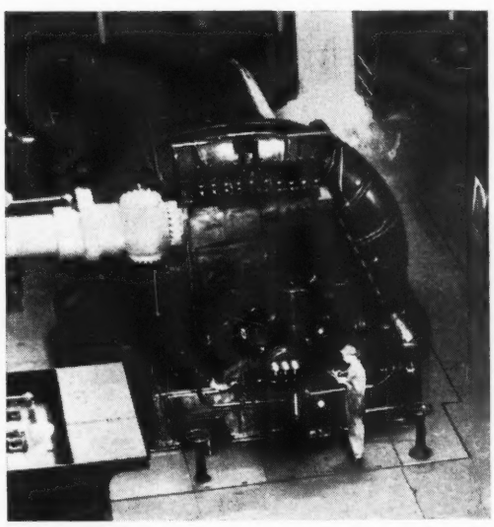
325 SAFETY PRODUCTS — Kimball Safety Products Co, 7314 Wade Park Ave, Cleveland, Ohio. Folio contains four separate catalogs covering eye, body and hand protection, and welders supplies. Each illustrates numerous safety products in respective fields.

Gulfcrest Oil

is super-refined—

It's Alchlor Processed!

The unequaled refining power of the Alchlor Process insures better turbine lubrication.



This 25,000 kw General Electric turbine is lubricated with Gulfcrest Oil A

GULFCREST OIL is not only refined from the best selected crude oils produced in the United States — it is super-refined by the Gulf Alchlor Process, the most effective method known for removing the undesirable constituents present in all crudes.

In addition to purifying the oil thoroughly, the Alchlor Process synthesizes and rearranges the molecular structure of certain of its hydrocarbons, resulting in a finished product of highest stability and endurance. Gulfcrest Oil is the world's finest oil for the lubrication of steam turbines!

Write today for the story of Gulfcrest Oil and what it can do for you—no obligation, of course.

GULF INDUSTRIAL LUBRICATION

Gulf Oil Corporation · Gulf Refining Company P
3800 Gulf Building, Pittsburgh, Pa.

Please send me my copy — no charge — of the brochure "Gulfcrest Oil."

Name.....

Company.....

Title.....

Address.....

HUYETTE WATER GAUGES

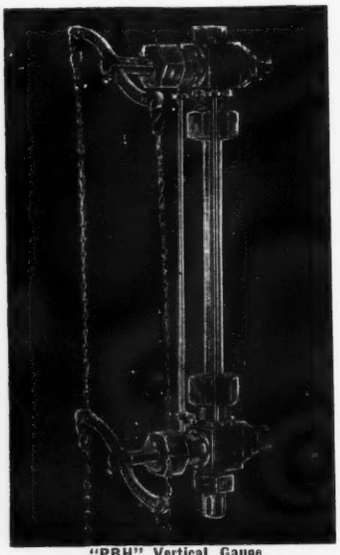
★ Quick Closing

★ Precision-Made to meet ASME Code

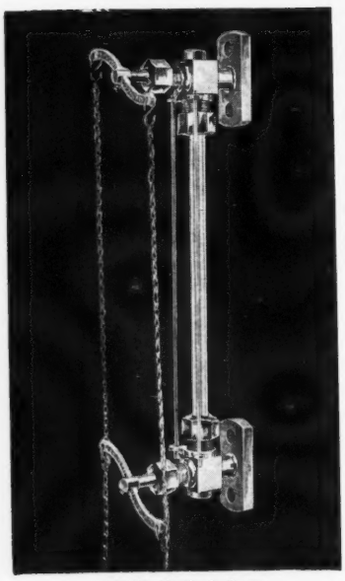
To the Power Engineer faced with the problem of making equipment do for the duration—the name "Huyette" on a water gauge gives reassurance. He knows that the gauge is made by a firm that has devoted forty-six years to the design and manufacture of a complete line of quick-closing gauges. Through experience he knows that Huyette's high standards of material, workmanship and inspection speak in actual performance.

All "PBH" valves are polished and well proportioned of heavy bronze alloy, according to A.S.M.E. Code, and stamped with maximum working pressure. Glass and stem nuts are large to accommodate ample size packings, insuring steam-proof, leak-tight service.

"PBH" Tiltview Gauges are recommended for easier visibility when gauges are high above the operating floor. Tiltview offset right or left hand—at 30 degree inclination.



"PBH" Vertical Gauge (screwed connection)



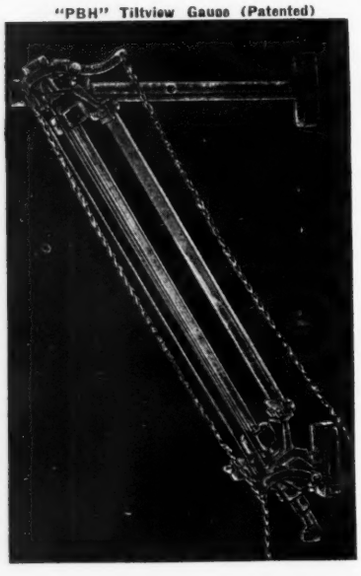
"PBH" Vertical Gauge (Flanged connection)

The PAUL B. HUYETTE COMPANY, INC.

Established 1896

401 North Broad St., Philadelphia, Pa.

"PBH" Tiltview Gauge (Patented)



FROM YOUR WARTIME DATA FILES

For complete data and specifications on all "PBH" Water Gauges, sizes, working pressures and pipe connections get our Bulletin No. 741. Contains useful photographs, charts and tables. Write today.

"P. B. H."
WATER GAUGES
VERTICAL-TILTVIEW
The PAUL B. HUYETTE COMPANY, INC.
401 N. Broad Street PHILADELPHIA, PA.
205 E. 42nd Street NEW YORK, N.Y.

326 POWER DISTRIBUTION—General Electric Co, Schenectady, New York. 16-page booklet GEA-3758 explains basic principles of load-center power distribution for industrial, naval and military projects, shipyards, central stations, and commercial buildings. Also lists chief advantages of system, illustrates available circuit arrangements, and shows typical installations of load-center substations.

327 HYDRAULIC OILS—E F Houghton & Co, 303 West Lehigh Ave, Philadelphia, Pa. 12-page booklet outlines the necessary qualities of a hydraulic oil and describes company's Hydro-Drive "MIH" series with improved oxidation stability.

328 SAFETY PRODUCTS—Davis & Murphy, Davis Bldg, Chicago, Ill. 4-page folder covers company's line of safety products including the GW cleaning and degreasing tool, liquid skin guard, electric lanterns, pumpless gasoline blow torch, eye and face shields.

329 NUTS—Grip Nut Co, 310 South Michigan Ave, Chicago, Ill. 6-page pocket-size folder answers questions, what, why and how, with regard to Grip Nuts. Illustrates four types of nuts: lock, holding, unit and locomotive, with their respective applications.

330 CONSERVATION FOLDERS — Manning, Maxwell & Moore, Inc, Bridgeport, Conn. Series of instruction pamphlets show how to make equipment last longer. Among the titles already issued are, "How To Make Your Thermometers Last Longer" and "How To Make Your Safety and Relief Valves Last Longer". Suggestions will be helpful even on competitive products.

331 AIRCRAFT PRODUCTION—General Electric Co, Schenectady, N. Y. GEA-3395, 42-page booklet, contains almost 200 photos of applications and products illustrating wide range of precision-built equipment for aircraft industry. Describes load-center power distribution systems, motors and controls for many uses, resistance-welding controls, arc-welding equipment, and such equipment for the plane as instruments, voltage regulators, motors, relays, generators, etc.

332 LIGHTING — Sylvania Electric Products Inc, Ipswich, Mass. 30-page catalog illustrates over 30 models of fluorescent lighting fixtures with technical specifications. Book also tells how to plan fluorescent installations and contains actual application photographs with general engineering and maintenance information.

333 SIRENS—Star Brass Mfg Co, 108-114 East Dedham St, Boston, Mass. 4-page folder outlines steam and air sirens, suitable for air-raid warning service, with photographs of each type. Also contains discussion of design and materials, which is resume of specifications.

334 SAFETY—Whiting Corp, 157th St and Lathrop Ave, Harvey, Ill. Manual contains rules for guidance of crane operators and hookers-on and for men working in the crane-operating area and the standard set of crane signals which have been adopted almost universally.

335 RUBBER CONSERVATION — U. S. Rubber Co, 1230 Sixth Ave, New York, N. Y. 48-page rubber-conservation manual discusses ways and means of making the present supply of rubber goods for civilian use last longer. Among the rubber products discussed are: hose, transmission, conveyor and elevator belts, mechanical packings, electrical tapes, wires and cables.

All literature designated with a star (★) may be obtained only by writing directly to the manufacturer on company letterhead, giving writer's name and title.

★ POWER PLANT EQUIPMENT—Williams Gauge Co, 2055 Pennsylvania Ave, Pittsburgh, Pa. 24-page catalog No. 142 contains technical data on such Williams specialties as pump valves, water gages, steam-pump governors, gage cocks, ball-type high-pressure steam traps, high- and low-alarm columns, etc.

3 Million Tons of iron and steel scrap are wanted every month . . . Are you doing your part to help America win her battle of production?

CONSERVATION AUTHORITIES RECOMMEND THESE 8 STEPS TO GET IN THE SCRAP

1 Put some one individual in charge of scrap in all departments of your business and GIVE HIM AUTHORITY TO ACT.

2 Comb the plant and yards for dormant scrap, abandoned equipment, old boilers, pipe, moulds, obsolete dies and parts, material now being destroyed which has salvage value.

3 Survey all plant equipment, particularly idle standby or discarded machines, with a view to applying or converting them to useful production.

4 SEGREGATION:
Identify, classify and segregate scrap and supervise its handling to avoid contamination. This will increase its value.

Provide separate containers, clearly marked, for each class of scrap material.

Repair or rework worn or broken cutting tools Keep unusable small pieces and turnings segregated. Even high speed steel grinding dust is valuable.

Dismantle discarded equipment promptly into its components—electrical, fastenings, lumber, etc.—so that these parts may be utilized or scrapped.

Sort blanks, short ends, cut-downs, clippings, etc., for possible reuse for smaller parts made in the same or other departments.

Recover and reclaim used cutting oils, lubricants, surplus paints and spray finishes.

Sort sweepings and miscellaneous waste to recover scrap values.

5 Constant reminders in the form of posters, illustrations of right and wrong methods, pay envelope enclosures, house organ publicity, etc., are potent aids to the conservation program.

6 Release for scrap, obsolete engravings, electrotypes, and standing types for catalogs, forms and advertising material.

7 Inspect all refuse to detect avoidable waste and excessive rejections. Educate production executives to correct such conditions at the source.

8 For information and assistance on special phases of conservation and salvage communicate with Industrial Salvage Section, Conservation Division, War Production Board, 9th Floor, Washington Gas Light Building, Washington, D. C., or with nearest regional office

The metallurgical experience of our technical staff is available to aid you in these and other technical phases of metal salvage.

KEEP SCRAP MOVING INTO WAR PRODUCTION!

THE INTERNATIONAL NICKEL COMPANY, INC. 67 WALL STREET NEW YORK, N. Y.

4 WAYS *Beckman* pH CONTROL CAN LENGTHEN THE LIFE... INCREASE THE EFFICIENCY... AND REDUCE OPERATING COSTS IN YOUR POWER PLANT!

Today, with equipment hard to get and "down time" doubly costly to America's all-out production effort, it is more important than ever that you investigate the increased efficiency, the longer life, the reduced operating costs Beckman pH Control can effect in your power plant. For every critical stage of your water treating operations you can install Beckman equipment to control the pH automatically for optimum efficiency. For example...

1. Prevention of Calcium Deposits in Feed Lines, Condensers, Exchangers, Valves!

For each type of softening operation there is a definite pH at which optimum precipitation of calcium is obtained. By controlling the pH, minimum residual hardness is assured. Then, what little hardness remains is prevented from precipitating in condensers, exchangers, valves, etc., by *lowering* the pH in this part of system. *Peak efficiency can be obtained only through accurate pH control!*

2. Obtaining Maximum Efficiency in Removing Impurities Through Coagulation!

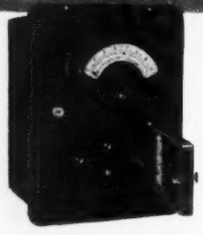
Formation of the floc is greatly influenced by the pH of the solution and the type of coagulant used. If alum is used, maximum floc is obtained at a moderately acid pH value... if sulphates predominate, a *lower* pH value gives best floc... while if chlorides predominate, a *higher* pH value—slightly alkaline—must be maintained for efficient flocculation. *Optimum sedimentation can be obtained only through accurate pH control!*

3. Reduction of Corrosion, Especially in Steam Condensate Equipment!

Rate of corrosion is a function of the pH of the water. Maintaining a high pH minimizes corrosion through formation of protective oxide coatings. pH must be sufficiently high to minimize corrosion, sufficiently low to prevent calcium precipitation (see No. 1 above). *Peak efficiency can be obtained only through accurate pH control!*

4. Protecting Costly Zeolite From Disintegration.

Zeolites are rapidly disintegrated by water with *low* pH, and are also softened and disintegrated by water of *high* pH. By Beckman-controlling pH before water enters zeolite, costly chemical losses are eliminated and vital plant economies are effected. *Here again, topmost efficiency can be obtained only through accurate pH control!*



BECKMAN IS THE *ONLY* pH EQUIPMENT *providing the high temperature glass electrodes necessary for modern power-plant pH control. These electrodes can be installed directly in treating tanks or flow lines for continuous pH measurement at high temperatures.*

The Beckman Automatic pH Indicator illustrated at left is the most advanced pH instrument available today. It will not only provide a continuous *indication* of pH in your water-treating operations, but will operate standard recording and control equipment as well to provide a complete *written record* and fully automatic *control*. For detailed information write for Bulletin 16!

Let our engineering staff make helpful suggestions in adapting modern pH control to your particular plant operations.

FREE! What Every Executive Should Know About pH . . . a helpful, easy-to-understand booklet on pH—what it is, how it's used. Send for your copy today.

NATIONAL TECHNICAL LABORATORIES • SOUTH PASADENA, CALIFORNIA

World's Largest Manufacturer of Glass Electrode pH Equipment!

Beckman THE LEADING NAME IN pH

336 FORGED SPECIALTIES—Lenape Hydraulic Pressing & Forging Co, P O Box 536, West Chester, Pa. 32-page catalog, 8-42, introduces and gives details of standard line of accessories in pressure-vessel construction. Photographs, diagrams and specification tables cover welding necks, nozzles, elliptical handholes and manholes etc. Also contains general reference data.

337 POWER UNIT—K R Wilson, 10 Lock St, Buffalo, N. Y. 6-page folder outlines features of heavy-duty KRW industrial unit, built around Ford V-8 engine with photographs of unit and typical applications. Unit operates on natural gas or gasoline.

338 WHITEPRINT MACHINES—Ozalid Products Div, General Aniline & Film Corp, Johnson City, N. Y. 4-page folder announces new Ozalid model "B" whiteprint machine. Describes mechanical features and specifications of Ozalid process.

339 TOURNACRANE—R G LeTourneau Inc, Peoria, Ill. 4-page bulletin features Tournacrane, a high-speed lifting tool for construction and industrial use. Booklet shows numerous applications around factory yards, industrial plants, building construction and earth work.

340 PRINT MAKING — Ozalid Products Div, Johnson City, N. Y. Booklet explains the Ozalid process of making dry-developed, positive-type whiteprints, offers suggestions about making prints, duplicate originals, corrections, etc, on whiteprint or dry-developing machines.

341 WATERPROOFING MATERIALS —Primoid Products Corp, 103 Park Ave, New York, N. Y. 4-page bulletin describes various rubber-base compounds, designed to stop leaks or seepage through brick, concrete, stucco or other types of masonry. These also prevent corrosion or rusting of metals because they are oil-, alcohol-, gasoline-, and acid-resistant. Lists typical users and comments.

342 RUBBER CONSERVATION — Manhattan Rubber Mfg Div, Passaic, N. J. Two 8¾ x 11 in. wall charts give information on proper care of rubber hose; the first covers fire hose and the second lists rules for proper care of air, water, steam, and other types of rubber hose and for attaching couplings properly.

343 HYDRO-ELECTRIC POWER— Allis-Chalmers Mfg Co, Milwaukee, Wis. 26-page bulletin B6184 includes descriptions of many of the world's great hydro-electric installations such as Boulder Dam, Santee-Cooper, Pickwick Landing, and Chickamauga. Also contains many views of representative installations of the 2½ million kva installed capacity of Allis-Chalmers waterwheel generators.

344 RUBBER CONSERVATION—B F Goodrich Co, Akron, Ohio. 8-page booklet entitled "Rubber Conservation for Users of Industrial Rubber Belting," tells how to save rubber by making vulcanized repairs promptly, by salvaging belts for smaller drives, by the Plylock splice and by proper care. Also gives examples of savings already made, and valuable rubber conserved.

345 PLASTIC TUBING — The Hodgman Rubber Co, Framingham, Mass. Bulletin No. T-1, 4 pages, introduces Saran, chemically-resistant plastic tubing and fittings by Hodgman for permanent replacement of stainless steel, brass, aluminum, tin, copper, nickel and rubber. Many photographs illustrate new line of fittings. Bulletin also contains tables of standard sizes and physical properties.

346 WHISTLES AND SIGNALS — Leslie Co, Lyndhurst, N. J. Bulletin 421 contains information on whistles and signals, their selection, construction, advantages, operation, installation, etc. Describes typical applications in marine, railroad and industrial service. Many photographs and diagrams illustrate these whistles and signals.

347 PLASTIC RUBBER—Robins Conveying Belt Co, Passaic, N. J. Job Sheet No. 1 introduces Malacca plastic rubber compounded for resistance to abrasion with mechanical grinding and strengthening ingredients. Also discusses mechanical and chemical properties, applications and important uses.

Call Clarage!

for EXPERT HELP on any WAR-TIME AIR-HANDLING PROBLEM

To give ***immediate assistance*** to our Government—and to industry engaged in vital war-time production — Clarage maintains sales-engineering offices at all the strategic points indicated on the map above.

Each Clarage branch office is ***manned by experts*** — by capable engineers long experienced in successfully meeting air-handling requirements of every conceivable kind.

On hundreds of America's fighting and cargo ships, in Army tanks, and in war plants from coast to coast — wherever DEPENDABLE ventilation, cooling, mechanical draft, etc., are essential — ***there fans, blowers and allied equipment built by Clarage play their part.***

We're on our toes to help you! We're trying hard to maintain a prompt, intelligent, satisfactory war-time service — all the way from initial recommendation to delivery.

It will pay you to dial our number in your city, or phone or write the factory at Kalamazoo.

COMPLETE AIR CONDITIONING
•
COOLING
•
VENTILATION
•
FACTORY HEATING
•
MECHANICAL DRAFT
•
FANS and BLOWERS for INDUSTRIAL NEEDS

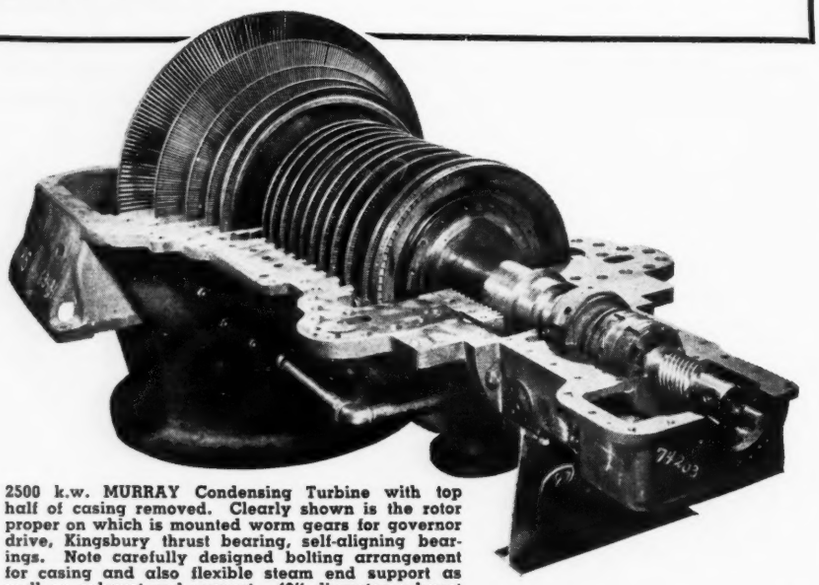
Clarage Fan Company Kalamazoo, Mich.

SALES ENGINEERING OFFICES IN ALL PRINCIPAL CITIES

MURRAY EQUIPMENT

HELPS WAR PLANTS

. . . establish dependable power facilities for stepped-up production



2500 k.w. MURRAY Condensing Turbine with top half of casing removed. Clearly shown is the rotor proper on which is mounted worm gears for governor drive, Kingsbury thrust bearing, self-aligning bearings. Note carefully designed bolting arrangement for casing and also flexible steam end support as well as exhaust end support. 48" diameter exhaust flange and 48" pitch diameter low pressure wheel is shown.

We have cooperated with industry for more than seventy years on steam power problems. Plants that were equipped with MURRAY Turbines — Boilers — Engines when the change-over was made to full time war production found dependability and economy in this equipment.

Our entire facilities have been devoted to filling orders from armament plants and other vital equipment producers since high priority ratings were made effective.

Today offers an opportunity for those not in the high priority class to study equipment on the basis of its performance now under fast moving conditions never before equalled. It insures sound planning for the time normalcy in production comes with peace. In this regard we suggest that you send for bulletins on MURRAY Turbines—Boilers—Engines.

BOILERS TURBINES ENGINES

MURRAY
IRON WORKS COMPANY
INCORPORATED 1870
BURLINGTON IOWA

348 PROCESS MACHINERY—Allis-Chalmers Mfg Co, Milwaukee, Wis. 12-page bulletin B-6177-A contains photographic illustrations, diagrams of operating principles, and lists features, sizes and capacities of basic machinery for the process industry. Also describes various processing applications such as mechanical separation and pyro-processing.

349 FIRE-EXTINGUISHING EQUIPMENT—Spray Engineering Co, 114 Central Street, Somerville, Mass. 4-page leaflet describes Spraco, portable Fire-Fog equipment for extinguishing oil and other flammable liquid fires. Also includes application photographs.

350 HEAT TRANSFER—International Nickel Co, Inc, 67 Wall St, New York, N. Y. 20-page data book contains information on heat transfer, together with charts and formulas for calculating over-all heat transfer rates that can be expected from metals and alloys in actual service. Also contains illustrations of process equipment that depend on heat transfer through metallic walls for normal operation.

News Notes

Floyd L Carlisle Dies November 9

Floyd L Carlisle, Chairman of the Board of Consolidated Edison Co of New York, and of Niagara Hudson Power Corp, died November 9. Mr Carlisle's preliminary education began at Watertown, N. Y., and Dayton Ohio. In 1903 he was graduated from Cornell University, where he studied law. He entered the public utility field in 1920, heading a syndicate which bought the Northern New York Utilities, Inc, the largest public utility operating company in the northern New York region, and became chairman of the board of directors.

In 1921 he came to New York to establish the firm of F L Carlisle & Co, Inc. In 1926, under Mr Carlisle's direction, the Northeastern Power Corp was organized. This company took over control of the Northern New York power properties, in addition to acquiring a substantial interest in the New England Power Association and the Mohawk Hudson Power Corporation. Mr Carlisle played a prominent part in the formation of the Niagara Hudson Power Corp in 1929, becoming chairman of the board of directors.

His first connection with the Consolidated Edison group came with his election as a director of the New York Edison Co in May, 1930. In February, 1931, he was made chairman of the board of New York Edison.

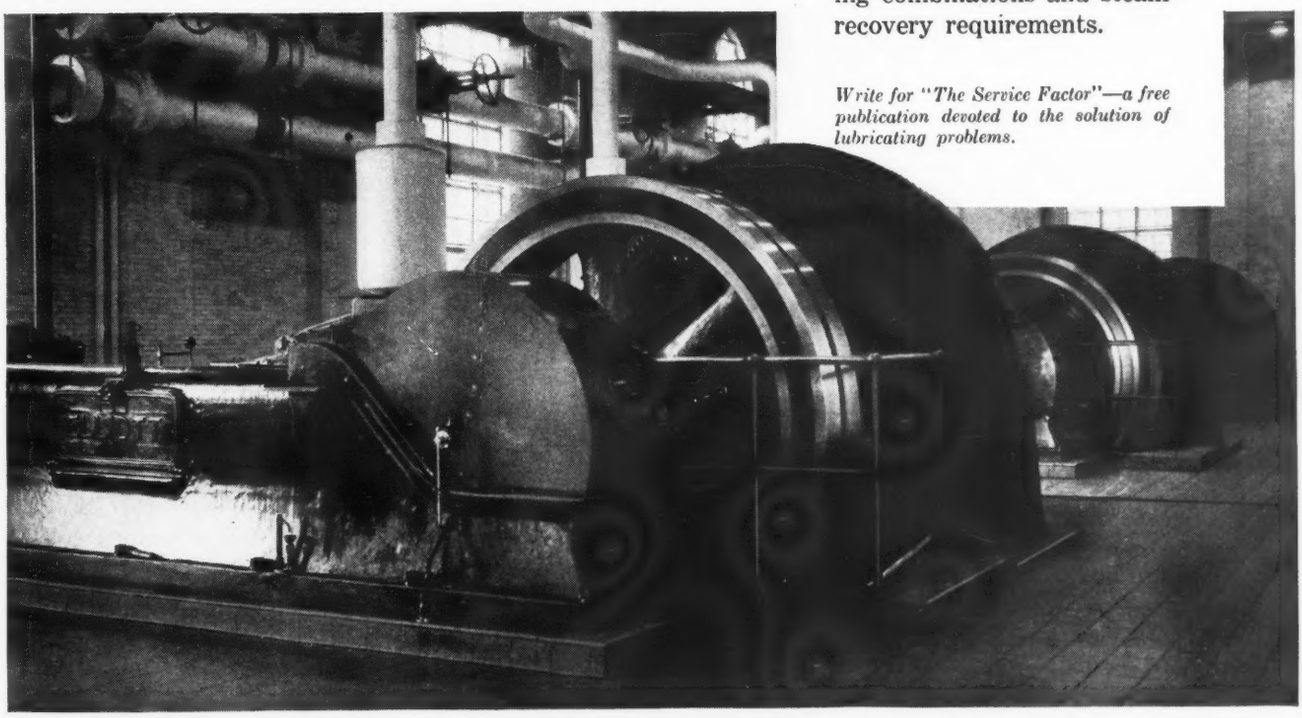
Walter S Wyman Passes

Walter S Wyman, 68, outstanding public utility leader in northern New England for nearly four decades, promi-

SECOND FRONT STRATEGY needs home front strength. For maintenance of peak operating efficiency and necessary conservation of equipment in *STEAM POWER* plants use

...SINCLAIR STEAM CYLINDER and VALVE OILS. These oils are designed for *correct* power house lubrication under all operating combinations and steam recovery requirements.

Write for "The Service Factor"—a free publication devoted to the solution of lubricating problems.



SINCLAIR INDUSTRIAL OILS

FOR FULL INFORMATION OR LUBRICATION COUNSEL WRITE NEAREST SINCLAIR OFFICE

SINCLAIR REFINING COMPANY (Inc.)

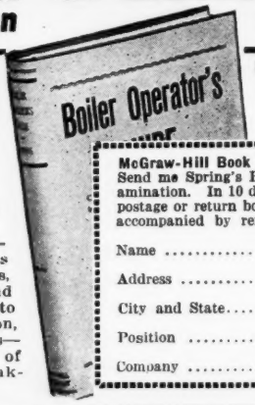
2540 West Cermak Road, Chicago • 10 West 51st Street, New York City • Rialto Bldg., Kansas City • 573 West Peachtree Street, Atlanta • Fair Building, Ft. Worth

THIS NEW **BOILER OPERATOR'S GUIDE** . . . can mean money to you!

Here's information of the most priceless sort for you—whether you want to improve your ability as an inspector or to utilize effective inspection methods in the more efficient, safer operation and upkeep of your own boilers.

Helps you meet everyday problems; Prepares you for license exams

With hundreds of typical examination questions and answers as well as complete instructions, this book presents fully and plainly the things you want to know about proper installation, operation, and care of boilers—the things that prevent dollars of loss in reduced efficiency, breakdown, or even accident.



By H. M. Spring, Jr.
353 pages, 6 x 9
241 illustrations
$3.00

Examine a Copy for 10 Days on Approval

McGraw-Hill Book Co., 330 W. 42nd St., N. Y. C.
Send me Spring's Boiler Operator's Guide for 10 days' examination. In 10 days I will send you $3.00, plus few cents postage or return book postpaid. (We pay postage on orders accompanied by remittance.)

Name .....
Address .....
City and State .....
Position .....
Company .....FP. 12-42

Safer Boiler Operation Easier Maintenance with ERNST FITTINGS

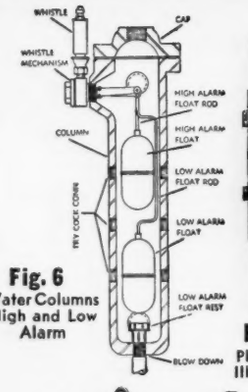


Fig. 6 Water Columns High and Low Alarm

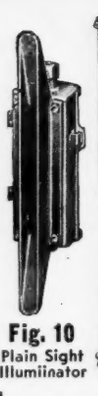


Fig. 10 Plain Sight Illumiinator

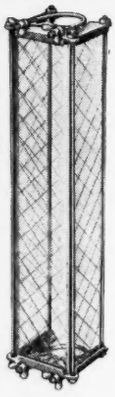


Fig. 9 Wire Glass Better-C Guards, All Sizes

Fig. 72-3 Inclined Split-Gland Adjustable Water Gages, No Gage Glass Packing Nuts

Fig. 13 Leakless Cocks, Bronze and Forged Steel

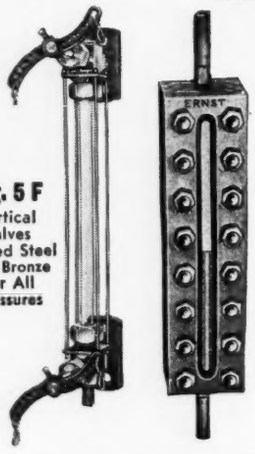


Fig. 5 F Vertical Valves Forged Steel and Bronze for All Pressures

Fig 45 "C-Clear Thru" Flat Glass Inserts

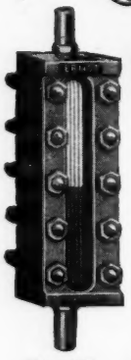


Fig. 37 C-BLACK Prismatic Flat Glass Inserts

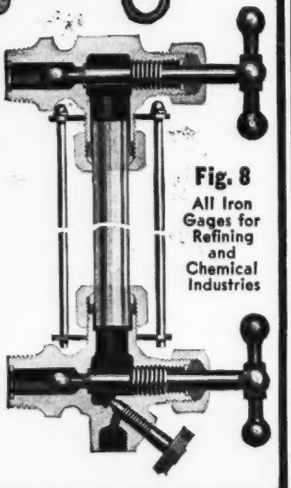


Fig. 8 All Iron Gages for Refining and Chemical Industries

For Immediate Delivery, send us sketches or blue prints of your requirements, along with quantities needed. Highest quality material and workmanship to meet your specifications.

ERNST WATER COLUMN & GAGE CO.
LIVINGSTON, N. J. Phone: Livingston 6-0276

nent industrialist and financier, and a prime mover in the development of hydroelectric plants and steam stations, died at Augusta, Me., November 15. He was a vital factor in the development of the Central Main Power, Public Service of New Hampshire, and Central Vermont Public Service properties, now affiliated with the New England Public Service Co, and at the time of his death was on the point of consummating a merger of the Central Maine and Cumberland County systems (Portland) under federal and state approval. Mr Wyman began electric power development at Oakland, Me., in 1905, on the Messalonskee Stream, and in 1910 formed the Central Maine Co, of which he became president in 1924.

David W Haering

David W Haering, president of D W Haering & Co, Inc., died on Oct 30, 1942. Mr. Haering was born in Chicago in 1908, and attended the Chicago grammar school and was graduated from the University of Illinois in 1929 with Ph.C. degree.

Mr Haering was the president and technical director of the company bearing his name, and was also an academic authority on scale and corrosion. Mr Haering was a member of many technical societies, including the American Chemical Society, the National Association of Power Engineers, the American Association for the Advancement of Science, the Chicago Section of the American Chemical Society, the American Society of Refrigerating Engineers, the National Association of Practical Refrigerating Engineers, and the American Society of Mechanical Engineers.

Allis Chalmers Men Get Advance Posts

The Allis-Chalmers Mfg Co announces several advancements and appointments to its engineering and personnel departments. The War Production Board announced in October the appointment of Edwin H Brown, engineering vice-president of the company as assistant chief of the iron and steel branch in charge of the plant facilities section. Mr Brown succeeds Don N Watkins, who resigned to return to his post as president of Steel Publications, Inc. During Brown's absence, Forrest Nagler, chief mechanical engineer, will be in charge of the Allis-Chalmers engineering and development department. W L. Manly has been named manager of the company's feedwater treating department. Mr Manly, since

EXACT CONTROL IS *Vital*..

— to maintain consistently uniform quality in the manufacture of Globe Steel Tubes. A large and fully equipped chemical and physical laboratory, manned by graduate metallurgists, is basic to the exact control of production maintained at Globe Steel Tubes Co.

GLOBE TUBES

In addition to the most advanced machinery and methods in the mill, under the direction of a large staff of experienced engineers and technicians, the Globe Steel Tubes Co. laboratory is another important factor which contributes substantially to the inherent quality of Globe Steel Tubes . . . quality which has won them high recognition with utilities, leading railroads, industrial and marine boiler builders.

GLOBE STEEL TUBES CO.
MILWAUKEE, WISCONSIN

GLOBE STEEL TUBES

STAINLESS TUBES • BOILER TUBES • CONDENSER AND HEAT EXCHANGER TUBES • MECHANICAL TUBING . .

5000

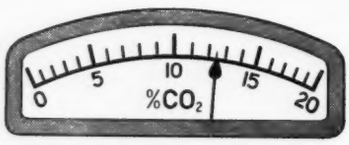
HOW TO

GET MORE POWER

FROM THE FUEL YOU BURN

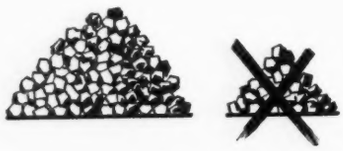
1. Install Ranarex* Instruments

No operating skill required—*anyone* can operate it. It's tough but sensitive—gives accurate readings instantly.



2. Measure CO_2 in flue gases

by simply glancing at the big clear reading scale. Then it's easy to adjust combustion until percentage of CO_2 is at exact point most efficient for your type of fuel.



3. Cut Costs as much as 20%

That's what users report. It's a worthwhile saving anytime—a patriotic duty today! Get full details about this amazing instrument now!

WRITE FOR FREE BOOKLET to The Permutit Company, Dept. A, 330 West 42nd Street, New York, N. Y. In Canada: Permutit Company of Canada, Ltd. . . . Montreal . . . Toronto . . . Winnipeg . . . Calgary.

*Trademark Reg. U. S. Pat. Off.

RANAREX

product of **PERMUTIT**

1940, has also been conducting practical research on industrial feedwater problems, based on his extensive field observations. Mr Manly, as a field engineer from 1937 to 1940, serviced many types of plants throughout the Middle West.

M L Carson acting engineer in charge, has been appointed manager of the engine and condenser department. In his new position, Mr Carson will direct sales and engineering of engine and condenser equipment, as well as all special work being contributed to the war effort. Mr Carson entered the Allis-Chalmers organization in 1915, and after completing the graduate student training course he served in the erection department, as a salesman in the Seattle office, and as a testing engineer on engines.

Marion Adds 125,000 Kw

With the completion of a new 125,000-kw turbine generator at the Marion Station of Public Service Electric and Gas Company, in Jersey City, the electric generating capacity of this station has been increased to 225,800 kilowatts and that of the entire Public Service system to 1,008,650 kilowatts. Another new 125,000-kw unit is under construction at the company's Burlington Station.

The low-pressure section (62,500-kw capacity) of the new unit at Marion carried load for the first time a short while ago. The high-pressure section of the same unit has been in service since July, 1941. This section is also of 62,500-kw capacity.

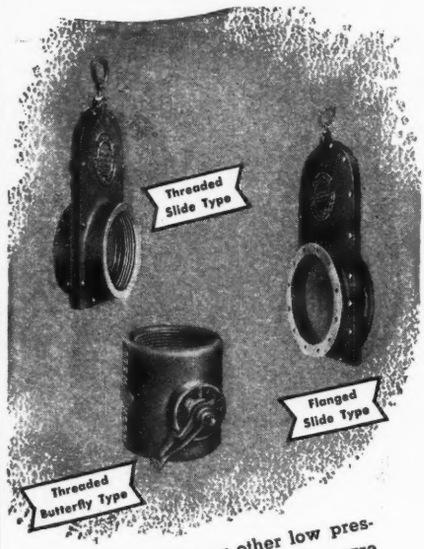
Since 1937 upwards of $90,000,000 has been allocated by Public Service for expansion and enlargement of electric facilities. Plans for the new installation at Marion, the 125,000-kw unit put in service at Burlington Station last year, the second 125,000 unit now under construction at Burlington and the enlargement of electric generating facilities at the company's Essex Station at Newark were made long in advance of the demand upon New Jersey industries for increased production in connection with the war effort.

Wartime Locomotive

The United States and Great Britain are cooperating on the production of a new wartime locomotive destined to be used not only on the railroads of Britain but on those of Europe too.

The new engine, whose keynote is simplicity of design, and which is to be used specially to haul munitions and troop trains, is called the "Austerity"

ROCKWELL BLAST GATES



If you have air, gas, or other low pressure lines, Rockwell Blast Gates are ideal for their control because

- They're a quality product, carefully machined and inspected
- Dependable, air-tight and permit accurate adjustment
- Made in all sizes and types, for every requirement

Thousands of Rockwell Gates are used throughout industry. They have proven the dependability and economy that make them the kind you should use.

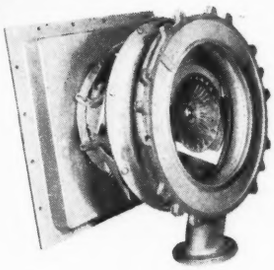
Catalog No. 4020 makes it easy for you to select the right types for your requirements. It's the most complete catalog on Blast Gates available. Send for your copy.

W. S. ROCKWELL CO.

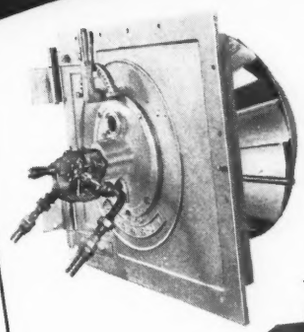
BLAST GATE DIVISION

50 Church St. • New York

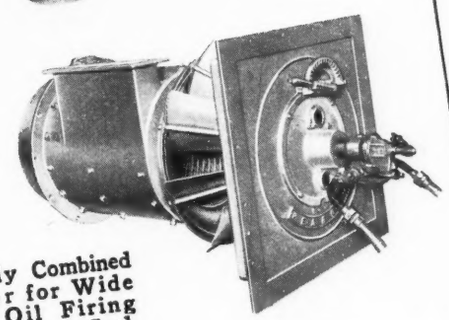
THE BUYER'S GUIDE TO *Good* COMBUSTION LEADS TO PEABODY BURNERS



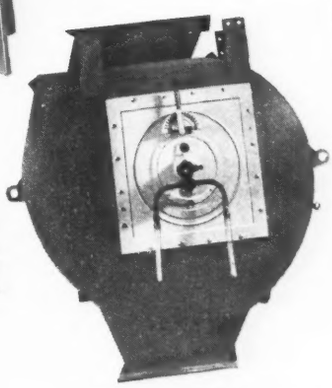
Peabody Combined Gas and Wide Range Oil Burner, Boiler Side.



Peabody Wide Range Oil Burner, Type H, with hinged front.



Peabody Combined Burner for Wide Range Oil Firing and Pulverized Coal.



Peabody Combined Blast Furnace Gas and Wide Range Oil Burner.

WHETHER you fire your boilers with oil, rich or lean gases, with pulverized coal, or combinations of these — run on natural or forced draft — have a large or moderate capacity — operate at a steady, uniform rate of output or have wide load fluctuations — —

There is a Peabody Burner that will handle the situation successfully.

Peabody Burners are the product of an organization that has concentrated on combustion equipment for many years. Continuous research and development have kept Peabody Burners abreast of progress in boiler design, anticipating the demand for increased capacities, more exacting firing limitations and higher fuel and operating economies.

An engineering organization that has been working as a team for many years — in both the Americas and abroad — is available to assist and recommend the correct burner installation for any given need. Use this service freely to work out your problems.

PEABODY ENGINEERING CORPORATION

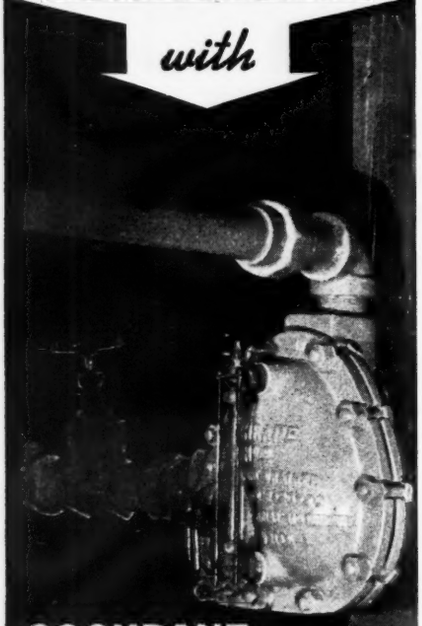
580 FIFTH AVENUE • NEW YORK

ATLANTA
BOSTON
CHICAGO
CLEVELAND
DENVER
DETROIT
EAGLE PASS (Tex.)
HONOLULU
HOUSTON
KANSAS CITY
LOS ANGELES
NEW ORLEANS
PHILADELPHIA
PORTLAND (Ore.)
ST. LOUIS
ST. PAUL
SAN FRANCISCO
SEATTLE

BUENOS AIRES • MEXICO CITY • MONTREAL

PEABODY LIMITED, LONDON

DRAINING
LARGE QUANTITIES OF LOW PRESSURE, DIRTY CONDENSATE
with



COCHRANE *Multiport* DRAINERS
at **S. D. WARREN CO.'s**
Cumberland Mills, Maine
• PAPER MILL •

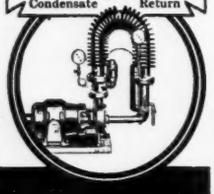
MANY Cochrane Multiport Drainers are in use at the Warren Cumberland Mills plant as they are in many other paper mills. The reason for their satisfactory operation is told by Mr. F. L. Wellcome, steam engineer at this plant: "These traps discharge continuously, the valve opening being determined by the height of water in the float chamber; the larger the volume of water, the larger the valve opening. The rotating movement of the sleeve valve serves to keep the valve free of sludge accumulation."

Write for Publication 2925 on Multiport Drainers

COCHRANE CORPORATION
3106 N. 17th St. Philadelphia, Pa.

Rapidly removes hot condensate from steam process equipment and returns it to boiler at high pressure and close-to-process temperature. IMPROVESQUALITY, INCREASES PRODUCTION, CUTS COSTS.

Ask about the new COCHRANE-BECKER System of High-Pressure Condensate Return



Cochrane

locomotive and is in production in both British and American locomotive factories. The decision to build the engine, which in the interests of economy and to speed up its production and save many hundreds of man-hours in turning it out has been stripped of all unnecessary gadgets and fittings, was taken after the British Army Staff and the U. S. War Department jointly agreed that a wartime locomotive was necessary. It was decided that the "Austerity" was the most suitable engine that could be built, and now British and American locomotive-building firms are combining their resources in order to meet the demand for the new engine.

The American-built "Austerity" locomotive differs slightly in design from the British-built model. The American is known as the "Consolidated" and bears the initials "U.S.A." and the number "2-8-0" while the British-built model carries the letters "W.D." (War Department) and a number on its tender. The engine is painted a khaki color.

Fitted with either vacuum or Westinghouse brake equipment, or both, and with an additional steam brake on the engine and tender, the "Austerity" is so designed that its firebox can be quickly adapted to burn either coal or oil fuel. Equipped with a specially large tender the engine will be able to operate in areas where fuel and water supplies may be far apart.

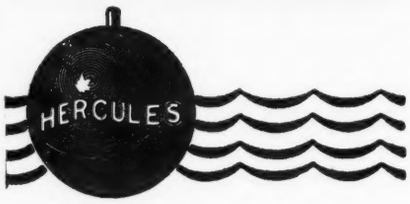
Weighing 80 tons (on all the drivers) the "Austerity" is designed to haul loads of from 500 to 700 tons at a top speed of between 30 and 40 miles an hour. An enlarged smoke box permits the removal of superheating elements and tubes without disturbing the steam pipes.

Power Distribution Systems Described

The importance of selecting the electrical distribution system best suited to the needs of individual industrial plants was recently described to a joint meeting of the Michigan Section of AIEE and the Detroit Industrial Electrical Engineers Society by John S Parsons, a Westinghouse engineer.

The best overall distribution system must not only consider service requirements and costs, but it also must keep the use of strategic materials to a minimum. The system that works well in one big industry may be totally unfit for its small neighbor across the street. The system that suited the manufacturer of wooden boxes wouldn't do at all in a big steel mill.

HERCULES
Seamless Copper
FLOATS



GUARANTEED TO STAND UP!

Every Hercules Float carries our guarantee to stand up under 350 lbs. working pressure and 500 degrees temperature.

Fabricated of seamless copper under our special spinning process. Hercules Floats are uniform in thickness and high in mechanical strength.

You can depend on Hercules for floats—in standard shapes up to 10 in. and in special types to your specifications—to give long, dependable, economical service.

Insure care-free maintenance of water level in your heaters, tanks, reservoirs and other equipment by specifying "HERCULES."

HERCULES FLOAT WORKS
200 Franklin St.
SPRINGFIELD, MASS.

Make Your Overhead Valves SAFE And Easy to Reach---

With the Babbitt Rim for Valves you eliminate danger and banish the step-ladder. You can now place your valves wherever they come economically and conveniently. They fit any valve. Let us tell you more about them. Write today.

BABBITT STEAM SPECIALTY CO.
New Bedford, Mass.

ALCO

PRE-FABRICATED PIPING

SHOP PRE-FABRICATION OF PIPING WILL REDUCE BOTH ERECTION TIME AND COSTS

Further Details in Bulletin No. 1031

AMERICAN LOCOMOTIVE COMPANY
ALCO PRODUCTS DIVISION
30 CHURCH ST., NEW YORK, N. Y. **DUNKIRK, N. Y.**

WHAT YOU SHOULD KNOW ABOUT PIPE HANGERS!

There is no place for guesswork in the selection of Pipe Hangers. The following excerpts from the American Standards Association Code for Pressure Piping give time-proved guidance to correct procedure.

MALLEABLE IRON CASTINGS may be used for pipe clamps, beam clamps, hanger flanges, clips and bases, swivel rings and similar parts of pipe supports, but their use shall be limited to such cases where the operating temperature of the pipe line will not be in excess of 450°F.

STEEL or WROUGHT IRON can be used throughout for hanger rods, turnbuckles, beam clamps, pipe clamps, supports, rollers, guides and bases.

GRINNELL offers an ENGINEERED PIPE HANGER

for each specific service . . .

MALLEABLE IRON ADJUSTABLE SWIVEL RING (Split Ring Type) – Underwriters Approved – Patented. Can be used with coach screw rod or machine threaded rod with practically any type of ceiling flange, expansion case, or insert. Swivel shank allows adjustment. No temporary support of pipe line is needed while making adjustments. Swivel shank locks automatically when pipe is in desired position. The hinging of the ring is off center, providing sufficient seating to hold the pipe before closing the ring.

WROUGHT STEEL ADJUSTABLE PIPE CLAMP – Underwriters Approved. Consists of two half-bands bolted together with Weldless Eye Nut and Bolt. When used with U.F.S. I-Beam Clamp with Weldless Eye Nut, provides for at least 3 inches of horizontal pipe movement in any direction per foot of hanger rod length.

For complete details, write for catalog of Grinnell Adjustable Pipe Hangers and Supports. Grinnell Company, Inc., Executive Offices, Providence, R. I. Branch offices in principal cities of United States and Canada.

GRINNELL

WHENEVER **PIPING** IS INVOLVED

The secondary network system now used by more than 50 industrial plants was designed to detour an industrial plant's power around a bomb hit or other interruption. No single fault anywhere on the system, whether accidental or deliberate, will interrupt service to more than a small part of the plant's production line. Power coming into the plant has two possible routes to motors or other equipment on the production line. If the first route is disrupted by a bomb hit, sabotage or accident, the electricity automatically takes the second route, preventing any shutdowns because of lack of power.

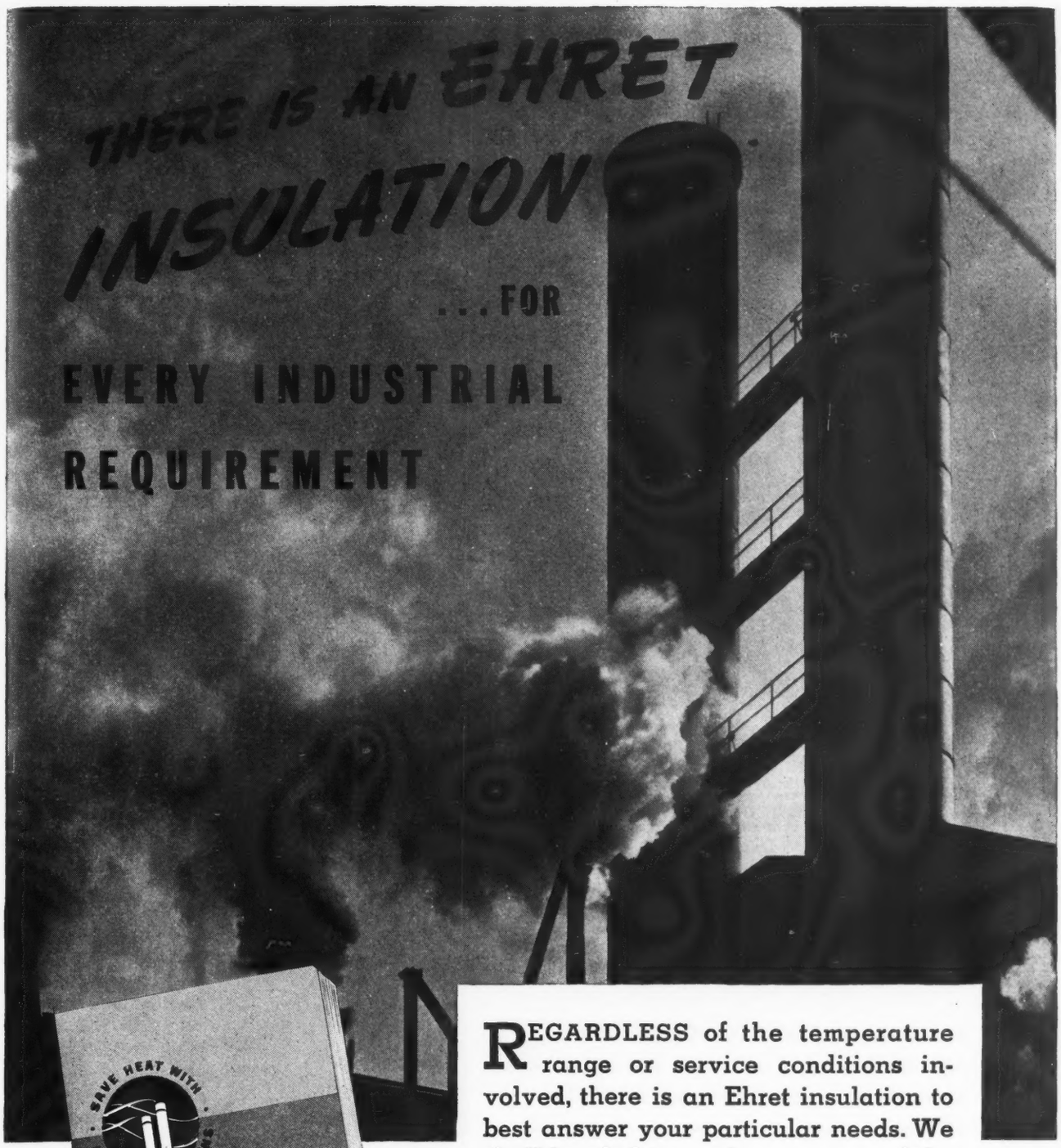
Many previous distribution systems for industrial plants were vulnerable because they were arranged radially and resembled a wheel with projecting spokes. Trouble on any branch of such a system stopped the power flow to all machinery beyond that point. An accident or damage at the hub, where transformers and other electrical apparatus were concentrated, sometimes closed down the whole plant until repairs were made.

The secondary network requires less transformer capacity and less copper and conduit, thus saving materials vital to the war effort. There are lower power losses and greatly improved voltage conditions. The network can be extended and other changes made without interrupting service to sections of the plant already in production.

WPB Orders Construction Halt

WPB has ordered an immediate halt in all non-essential Government construction. In the power field, this means that Federal projects allowed to continue operations with materials on hand under A-6 or lower ratings in the order curtailing power expansion last summer will now be stopped entirely; also, in all probabilities, several generators and dams included in the August program will be abandoned for the duration as a result of the new tightening up policy.

In announcing its "stop-construction" action, WPB did not make public a list of affected projects pending a final determination as to their actual relationship to military needs. It was indicated that the Bureau of Reclamation will urge that some of its non-excepted projects be allowed to continue. Among these, it was understood, is Keswick dam, which was earmarked for completion and installation of two of three generators last August but



REGARDLESS of the temperature range or service conditions involved, there is an Ehret insulation to best answer your particular needs. We shall be glad to send you a copy of the 176-page Ehret Insulation Handbook—it contains answers to practically all the problems involved in selecting, specifying, applying and maintaining insulations on hot and cold piping and equipment. Write for your copy today.

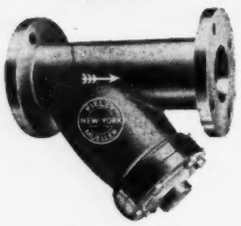
EHRET MAGNESIA MANUFACTURING CO.
VALLEY FORGE, PENNA.

. . . THERE IS AN *EHRET* DISTRIBUTOR OR CONTRACTOR IN EVERY INDUSTRIAL AREA

K & M STRAINERS are built by Specialists since 1879

We're "ALL OUT" so the AXIS will be "ALL IN" Please bear with us for the duration

Back of K&M Strainers as well as all K&M steam specialties is an organization of engineers with an accumulated experience going back more than 63 years. An extensive line has been developed by Kieley & Mueller to cover power and process service requirements. Typical strainers in the K&M line are shown here.

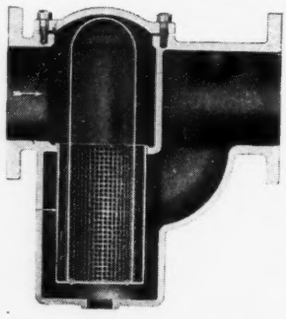


"Y" STRAINERS

Designed for use on steam, water, air, gas, oil and other fluids K&M "Y" Strainers provide an efficient means of extracting foreign matter. Large strainer basket area assures minimum pressure loss. Baskets easily accessible for cleaning. Sizes: ½" to 6".

BASKET OR SUCTION STRAINERS

Designed and built for removing and preventing foreign matter from entering lines leading to vacuum pumps, feed pumps, water works lines, etc. May be used on water, oil, gas, steam or other fluids. Large free area strainer basket allows minimum pressure drop. Basket easily removed for cleaning. Sizes: ½" to 18".



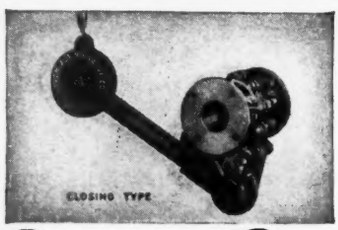
KIELEY SINCE 1879 MUELLER

KIELEY & MUELLER

General Offices and Factory

2013-2033 — 43rd Street, North Bergen, N. J.

Reducing Valves — Liquid Level Controls — Float Valves — Pump Governors — Strainers — Control Specialties.



QUICK-OPERATING VALVES

FOR FIRE PROTECTION

Everlasting Valves, weight-operated with pendulum stop, are expressly suited to fire protection service. These positive-acting, thoroughly reliable valves are widely used on foam systems, sprinkler systems, fuel line shut-off, dip tank discharge, enamelling tank discharge, electric generator protection, and similar services.

Send for Bulletin

Everlasting Valve Co., . . . 49 Fisk Street, Jersey City, N. J.

dropped entirely from the approved list in the recent order.

The Bureau announced that WPB's notice of the stop order excepted these projects: Parker dam, four 30,000-kw units; Boulder dam, units A5 and N7; Shasta dam, units No. 3 and 4; Green Mountain Dam, two units totaling 21,600 kw; Grand Coulee dam, units No. 4, 5 and 6 and two 75,000-kw units previously shifted from Shasta. This is the same list of Reclamation projects which Secretary Ickes announced as having gotten the "green light" in WPB's August power program, except for Keswick and unit No. 5 at Shasta, now also apparently dropped.

Tennessee Valley Authority announced that under the WPB order it was immediately abandoning for the duration the Wautaga and South Holston dam projects which had been proceeding on A-6 ratings under the August program. Neither of these dams was scheduled to get generators under the previous power expansion schedule, however.

Other TVA generator units dropped from WPB's August program apparently are continued in the "stop list" by WPB's latest action, and it was understood that dropping of one or two additional units may be decided upon later.

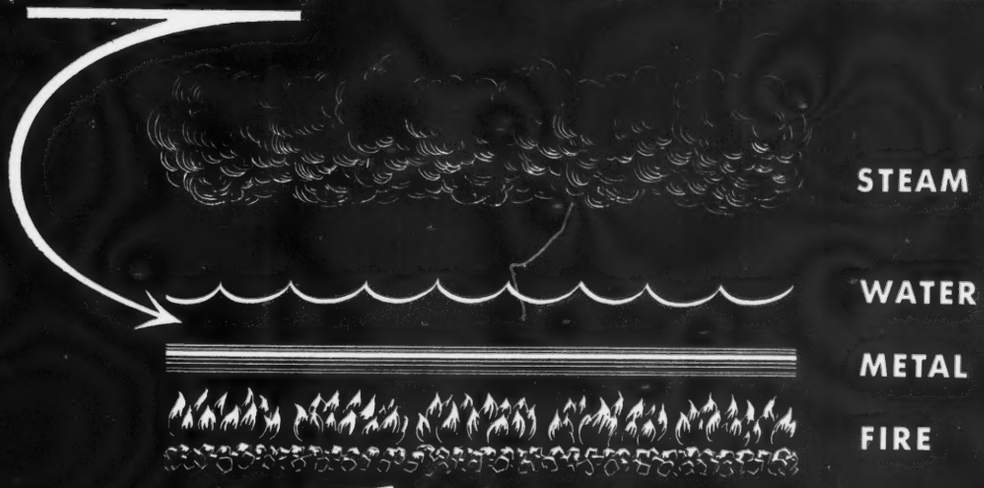
The U. S. Army Engineers did not comment upon WPB's stop order other than to say that work would continue only on projects approved in August unless contrary instructions were received.

WPB's order was aimed primarily at Federal construction outside the power field, inasmuch as the power program previously had been culled down and non-vital jobs limited to operations which could be carried on with equipment and materials on hand. Chief effects of the new action will be to stop some of these projects more quickly and to make possible a further relatively small scaling down.

Appeals from the stop order will be considered by a newly-created WPB Facility Clearance Board consisting of ranking officers from the Army and Navy, and representatives of the Maritime Commission with Ferdinane Eberstadt, vice-chairman of WPB, as chairman.

Changes by the War Production Board in its order of October 20 directing that construction be halted on all but five of the Bureau of Reclamation's power, irrigation and municipal water projects in the West were announced Nov 21 by Secretary of the Interior Harold L Ickes.

Forcing your boilers? Be sure heat-transfer surfaces are clean!



THE heat-transfer surface—that's where fuel is wasted by "misplaced insulation" caused by improperly treated feedwater. That's where metal is overheated, where it weakens, fails and causes boiler shutdowns.

You can't afford to take chances in these days of critical materials and forced production. That's where Permutit* can help. Below are shown some accepted methods of boiler feedwater conditioning that are helping thousands of plants. They can help you. Let us discuss your operating problems with you. Just drop a line to The Permutit Company, Dept. A, 330 West 42nd Street, New York, N. Y.

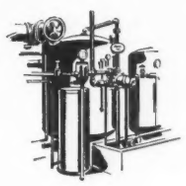
In Canada: Permutit Company of Canada, Ltd. . . Montreal . . Toronto . . Winnipeg . . Calgary.

*Trademark Reg. U. S. Pat. Off.

PERMUTIT

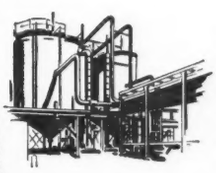
WATER CONDITIONING HEADQUARTERS

ZEO-KARB* H



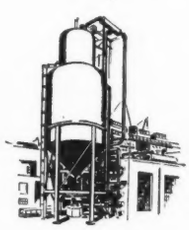
The new Permutit Zeo-Karb H water softener removes both hardness and bicarbonates from the raw water. The effluent is soft and reduced in total solids and alkalinity. The sulphate-carbonate ratio may be adjusted as desired by blending.

HOT LIME SODA



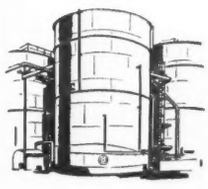
Lime and soda ash in correct proportions, precipitate the bulk of the hardness as calcium carbonate and magnesium hydroxide. The sludge that is formed is settled out in the settling tank after which the water is filtered. Integral deaerator simultaneously removes the oxygen.

DEAERATING HEATER

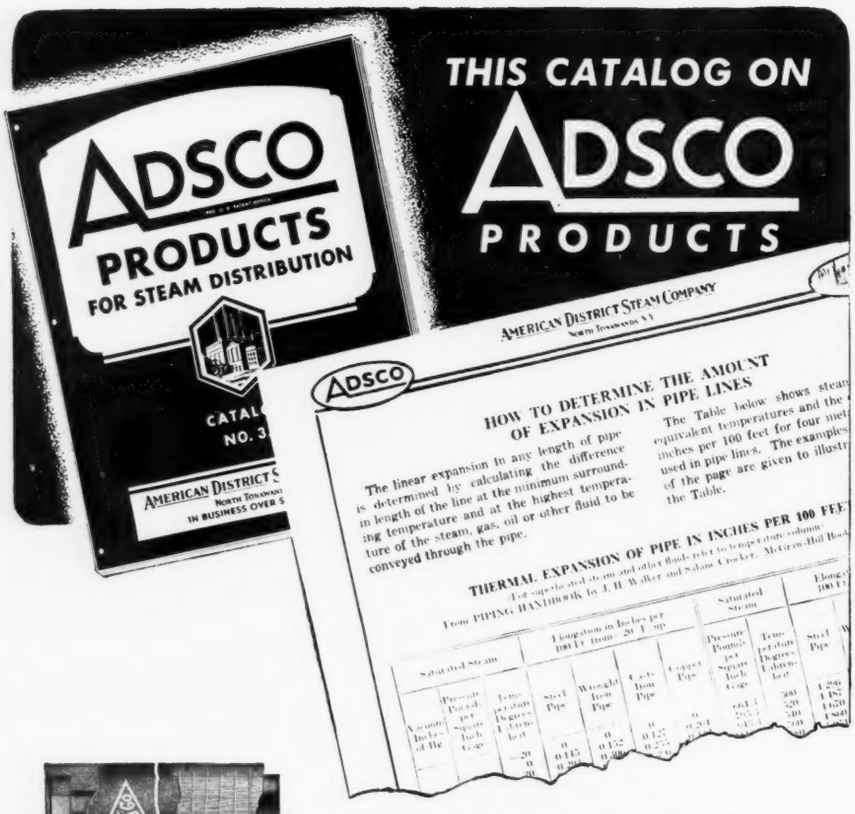


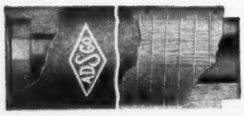
The new Permutit Deaerating Heater, utilizing exhaust or bled steam, is guaranteed to remove all oxygen and free CO_2. It is designed for pressures up to 100 pounds or higher. Capacities from 12,500 to 1,400,000 pounds per hour are in service.

SILICA REMOVAL

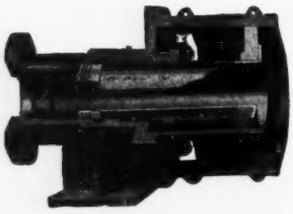


Permutit's new process is adaptable to Hot or Cold Lime Soda treatment, and can be applied to existing equipment. It reduces silica content to any degree desired . . . eliminates scale and deposits. The reagents used are low in cost and do not add soluble by-products.





ADSCO RED DIAMOND BRAND WOOD CASING. Widely used for war projects because its wood construction saves metal.



ADSCO PISTON-RING EXPANSION JOINTS. Fully guided. Can be packed under pressure.

ADSCO HEATERS AND ECONOMIZERS. All sizes and types — storage or instantaneous.

ADSCO-BANNON TILE CONDUIT. A strong, vitrified conduit for underground steam and hot water lines.

Will Help You Plan SERVICE LINES *For War Projects and Plants*

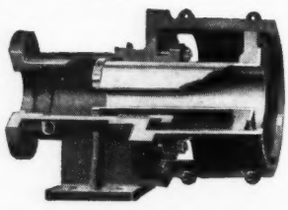
Follow the example of engineers, working on America's largest war projects.

Make the ADSCO Catalog your guide for economical and efficient operation, whenever you specify or purchase expansion joints or other equipment for steam, hot water, fuel oil and gasoline lines.

AMERICAN DISTRICT STEAM COMPANY
N. TONAWANDA, N. Y.
Making "UP-TO-DATE" Steam Line Equipment for Over 60 Years

● ***OTHER PRODUCTS INCLUDE:***

Adsco Flow Meters . . . Condensation Meters . . . Steam Traps . . . Pipe Supports Saddle Plates . . . Alignment Guides, etc.



ADSCO INTERNALLY-EXTERNALLY GUIDED EXPANSION JOINT. Meets the specifications of Army and Navy.

Of 41 projects affected by the previous order of the WPB, the changes permit construction to continue on ten under preference ratings previously issued. Certain specified construction may proceed on nine projects. Work was directed to cease on fourteen and action was deferred on eight projects pending the receipt of additional information.

The modifications were set forth in a letter dated November 16 from WPB Vice-Chairman Ferdinand Eberstadt, who advised the Secretary that a review of the Bureau's construction program had been completed. Pending this review, WPB Chairman Donald Nelson had agreed to a proposal by Secretary Ickes that construction should continue on all projects, including six on which specific shutdown orders had been issued by the War Production Board. These projects had scheduled power installations of 865,000 kilowatts by 1944-45.

A hearing was held on November 13 by the WPB Facility Review Committee. The continuance of work on power and irrigation projects essential to the prosecution of the war was urged by Under Secretary Abe Fortas, Commissioner John C Page, Assistant Commissioner H W Bashore, Chief Engineer S O Harper, of the Bureau, and Arthur Goldschmidt, Acting Director of the Department's Division of Power.

The five projects, originally excepted from the WPB shut-down order, involve the installation of 928,600 kilowatts of power by May 1944 as follows: Grand Coulee Dam, 5 generators in 1943; Parker Dam, 4 generators by May 1943; Boulder Dam one generator in 1943, one in 1944; Shasta Dam, 2 generators in January 1944; and Green Mountain Dam, 2 generators by March 1943.

Secretary Ickes declined to comment at this time on the effect of the Eberstadt letter on war power and food supplies of that part of the letter curtailing power installations on some projects and shutting down other projects entirely. He said he would await final action on the deferred projects and on procedural clarification of certain parts of the letter which he was requesting the War Production Board to make in formal orders to be printed in the Federal Register. Pending the formal orders, the Secretary said, work would continue on all projects.

Mr Eberstadt's letter in part is as follows:

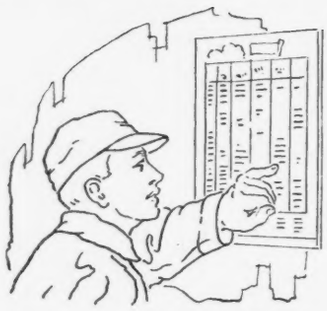
The review of projects being prosecuted by the Bureau of Reclamation has been completed.

Aircraft Carriers and Destroyers use KELLOGG prefabricated High Pressure Piping

KELLOGG

THE M. W. KELLOGG COMPANY
JERSEY CITY, N.J. · 225 BROADWAY, N.Y.
Representatives:
LOS ANGELES: 609 SOUTH GRAND · TULSA: PHILTOWER BLDG.

"Masterflex" Prefabricated Piping Systems · **"Masterweld"** pressure vessels for Power, Refinery and Chemical Industries. Heat Exchangers. Pyrolytic and Catalytic Cracking Units, Reforming, Dehydrogenation, Alkylation, Desulphurization. Thermal and Catalytic Polymerization Units · **JUIK Processes** for Lubricating Oil Plants. Plastic Refractories · Radial Brick Chimneys.



The Palmetto ABC Chart of Packing; Service Recommendations is yours for the aksing. Write for your FREE copy.

TO ALL ENGINEERS:

Do you know all the services on which you can use PALMETTO, the many-purpose packing?

For example:

APPARATUS

- All valves
- Steam engines
- Turbines
- Stokers
- Soot blowers
- Boiler feed pumps
- Expansion joints
- Air compressors
- Condensate pumps
- Vacuum pumps

FLUIDS

- Steam
- Hot water
- Air
- Mild acids
- Mild alkalis
- Gritty water
- Gases

TWISTED or BRAIDED

For valve stems; each strand a perfect piece of lubricated packing.

For rods and shafts; has uniformly even bearing surfaces.

Free WORKING SAMPLE

Just send us your name and address, stating size and operating conditions for packing, and a generous sample will be sent you without charge or obligation.

GREENE, TWEED & CO.

Bronx Blvd. at 238 St. New York, N. Y.

PALMETTO

for steam, hot water, air. PALCO *for water.*
PELRO *for oils.* CUTNO *for alkalis.*
SUPERCUTNO *(blue asbestos) for acids.*
KLERO *for foods.*

SELF-LUBRICATING
PACKINGS

The following projects may continue to completion subject to limitations contained in Preference Rating Orders previously issued by the War Production Board:

No. 7—Parker Dam Project, Arizona—Parker-Bagdad Transmission Line.

No. 8—Parker Dam Project, Arizona—Substations and Transmission Line.

No. 9—Parker Dam Project, Arizona—Transmission Line from Gila Substation to Yuma, Arizona.

No. 12—Boulder Canyon Project, Nevada-Arizona—Boulder City Hospital.

No. 15—Boulder Canyon Project, Nevada-Arizona—Boulder City Booster Pumps.

No. 16—Rio Grande Project, Texas—Power Division.

No. 17—Grand Coulee Dam Project, Washington—De-icing Equipment for Spillway Gates.

No. 21—Central Valley Project, California—Facilities for Preservation of Fish (exclusive of Keswick Trap and Racks).

No. 28—Buford-Trenton Project, North Dakota.

No. 32—Owhyee Project, Oregon.

WPB Sets Up Invention Board

To insure the quickest and most effective utilization of inventions, mechanisms, processes and materials that can be used in the production of war goods, Donald M Nelson, chairman of the War Production Board, announced the establishment of an Office of Production Research and Development. Mr Nelson said that Dr Harvey N Davis, president of the Stevens Institute of Technology, will be director of the new agency.

The new office, Mr Nelson said, will have four principal functions:

To provide technical information on problems and on research and development work in progress in the WPB. The office is also to provide the WPB divisions and branches with research information and findings on work which they have in progress.

To initiate evaluation and analysis of specific scientific or technological proposals, through the establishment of expert committees or through reference to existing research groups in government, education or industry.

To get needed research accomplished, by contracting with outside laboratories or agencies for experimental work.

To bring about development of such projects or processes as are found to

WHEN PUMPING CONDITIONS CHANGE—

The

COFFIN-Steam Turbine CENTRIFUGAL PUMP

Stays-On-The Job

1. Because the variable speed turbing drive permits a wide, efficient initial range without part substitution.

2. Because by substituting a few internal parts, such as impeller, diffuser ring, wearing rings and turbine nozzeling, wide changes can be made in capacity and pressure.

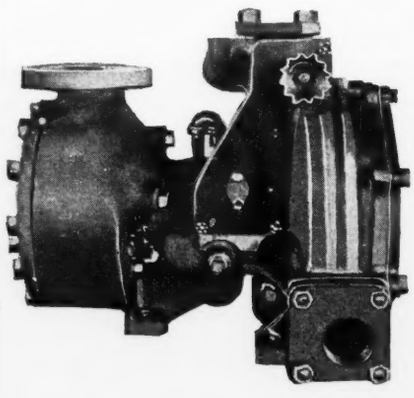
This adaptability to changing conditions makes the Coffin Pump a Life-Time Pump, and an economical investment.

PRESSURES

To 750 Lbs. Sq. In.

DELIVERIES

To 500 G.P.M.



THE J. S. COFFIN, JR. CO.

ENGLEWOOD, N. J.

He'll live!...to fight again

IN THE oil-slicked waters of a darkened sea, one of our fighting airmen is forced down. Miles from nowhere—nothing more than a dot on a limitless expanse of ocean—the pilot's life could well be despaired of, were it not for the swift rescue boats whose ever-watchful patrol saves valuable fighting men to fight again.

These crash boats are ready for any emergency, and their ability to get there—in a hurry—is both a tribute to their sleek design and to the highly efficient engines which power them. Behind the whirling propellers which speed these craft through the water are gears—Foote Bros. gears of such extreme precision that until a short time ago, they were considered a laboratory product.

But engines for rescue boats and torpedo boats—engines for fighters, bombers and aerial freighters, called for gears in such quantities that only mass production methods could supply the demand.

And today these "jewels of power transmission" are flowing out in ever-increasing quantities to speed America's fighting forces—in the air and on the waves—to Victory.

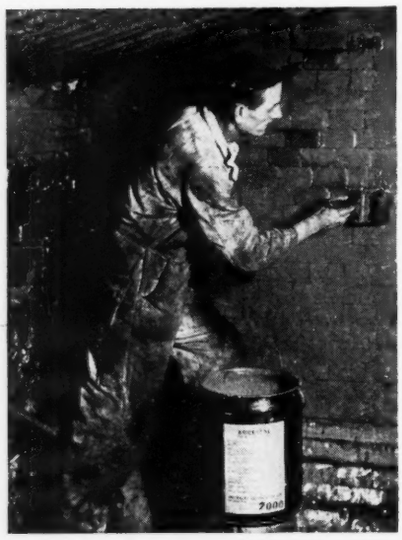
The new manufacturing techniques, and new ways of coupling extreme precision with mass production developed in the plant of Foote Bros. mean more and better aircraft and marine engines. These same lessons applied to the world of tomorrow will mean better machines, more compact and more efficient machines produced at costs that promise greater savings to America's manufacturers.

FOOTE BROS. GEAR AND MACHINE CORPORATION
5301 South Western Boulevard
CHICAGO

FOOTE BROS.

Better Power Transmission Through Better Gears

"BRICKSEAL" YOUR REFRACTORY LININGS



TRY THIS temperature-resisting armor plate — and minimize shutdowns

BRICKSEAL is the solution to the problem of frequent shutdowns caused by breakdowns in refractory linings. BRICKSEAL is the answer because it forms a highly glazed semi-plastic armor plate surface over the refractories and is impervious to temperature changes.

BRICKSEAL — a combination of high fusion clays and metals combined in oils—is available for all temperature conditions and is easily applied either by air spray or hand brush. It is unaffected by acids, alkalies or gases and will not crack, peel or blister. It provides a rugged binder for cracked and loosened fire brick as well as protection against clinkering, slagging or spalling. In furnaces fired with fuel oil, BRICKSEAL prevents absorption of any unignited oil by the refractories.

BRICKSEAL is being used today in practically every type of boiler and under all types of firing conditions—for new walls as well as for refractory maintenance.

Write today for full and complete information. It will pay you to have a BRICKSEAL man call.

DESIRABLE TERRITORIES AVAILABLE

Openings for sales representatives are available in certain desirable territories. Investigate!

BRICKSEAL REFRACTORY CO.
1029 CLINTON ST.
HOBOKEN, N. J.

merit it, through contracting for the construction of prototypes or the erection of pilot plants.

Tension Factor Important

Conclusive evidence that the life of transmission belting and V-belts is greatly influenced by the tension factor, and that an increase in the tension over that recommended for the belt operation will result in failure of the belt long before it should break down is furnished by data from a series of tests conducted under the supervision of George H Stewart, belting engineer of The B F Goodrich Company.

Results of the tests are released by the company as another contribution to the country's rubber conservation program.

Three grades of the present wartime construction of transmission belting were used in that series of tests, which were run at 15 pounds per inch per ply, a 720 pound total for the tension, the recommended figure, and at 18 pounds per inch per ply, a total of 864 pounds tension, on 4 inch pulleys. Belts were all 6 inches wide, 30 feet in length, spliced in 10 foot endless lengths. Tests were all highly accelerated.

Belt No. 1 ran for 95 hours before breakdown while under the 18 pound tension, and increased its life to 230 hours before failure when the 15 pound tension was used.

Belt No. 2 ran for 88 hours at the 18 pound tension, and for 263 hours before failure at 15 pounds.

Belt No. 3 ran for 15 hours under 18 pound tension, and the service life before failure jumped to 48 hours under the 15 pound tension.

Conclusions reached, Engineer Stewart's report says, are that an increase of three pounds per inch per ply over the recommended tension results in the belt giving only approximately one-third of its useful service life.

Similar conclusions were drawn from tests conducted on one style of V-belts, used on a popular make washer. The accelerated test consisted of a dead load suspension with the driver sheave 2⅝ outside diameter by ½ inch top by 36 degrees and the driven sheave of 5¼ inch outside diameter by ½ inch top by 40 degrees.

First three belts under tension of 125 pounds center to center, averaged 4½ hours of life before failure.

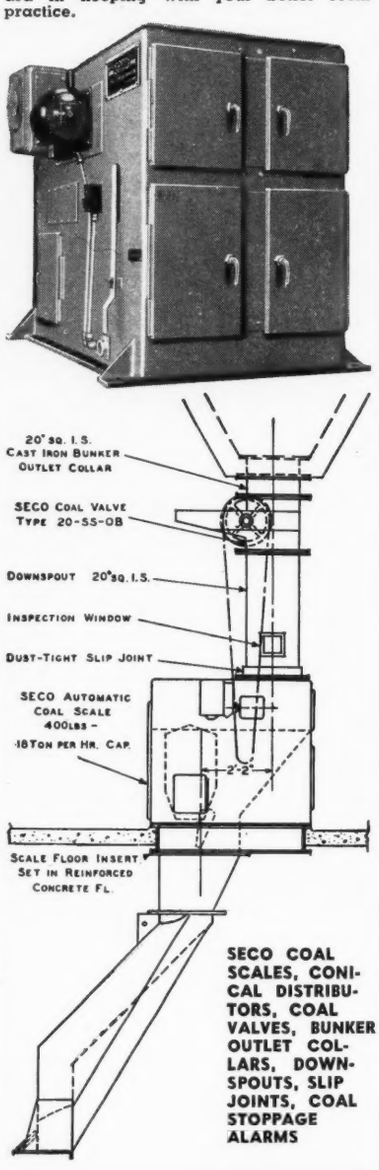
Second three, under 95 pound tension centers averaged 27.4 hours, while the last three, under 80 pounds, averaged 86 hours.

...one supplier...one responsibility...one guarantee...

STOCK

"BUNKER - TO - STOKER & BUNKER-TO-PULVERIZER" INSTALLATIONS

As builders of complete coal feeding systems, STOCK offers you "teamed-products" . . . each built to work with the other, to give maximum service and efficiency. Advantages for you? . . . the assurance of a coal feeding installation made just for your boilers . . . one supplier, one responsibility, one guarantee. Separately or as a group, SECO products are built to a quality standard in keeping with your boiler room practice.


20" sq. I.S. Cast Iron Bunker Outlet Collar
SECO Coal Valve Type 20-SS-OB
Downspout 20"sq. I.S.
Inspection Window
Dust-Tight Slip Joint
SECO Automatic Coal Scale 400lbs - 18Ton per Hr. Cap.
2'-2"
Scale Floor Insert Set in Reinforced Concrete Fl.

SECO COAL SCALES, CONICAL DISTRIBUTORS, COAL VALVES, BUNKER OUTLET COLLARS, DOWNSPOUTS, SLIP JOINTS, COAL STOPPAGE ALARMS

STOCK ENGINEERING COMPANY
9807 Theodore Ave., Cleveland, Ohio

For Large Tubes and Pipes

TUBE CLEANERS — Air, Steam or Water Driven — for Boilers, Condensers, Evaporators, Cracking Coils, Stills and other Heat Exchangers, give you More Power—Faster Cleaning—One-man Operation

For Small Tubes

ROTO

Model 130 air-driven motor with swing-frame head for straight tubes

Model 20 water-driven motor with combination drill head

Model 135 air-driven motor with vibrating head for fire tubes

Swing-frame head for straight tubes

Large wire brush

Model 110 air-driven motor with 6-way drill head

Short 3-arm head

Combination drill with replaceable wearing parts

Model 130 air-driven motor for curved tubes, with air-valve and swing-frame head

Model 71 air-driven motor with drill head

Model 23 water-driven motor with pivot head

Model 39 air-driven motor with pivot head and air valve

Sectional wire brush and replaceable section

Floating cutter head

Universal joint and drill head

Model 105 air-driven motor with 2-arm head and air valve

Model 33 Junior motor with cone cutter head

Model 34 Junior motor with wire-flexible coupling, expanding scraper head and replaceable blade

Expanding brush and replaceable section

Complete parts of Model 33 Junior motor, showing simplicity in design

Let us help you with your tube cleaner problem

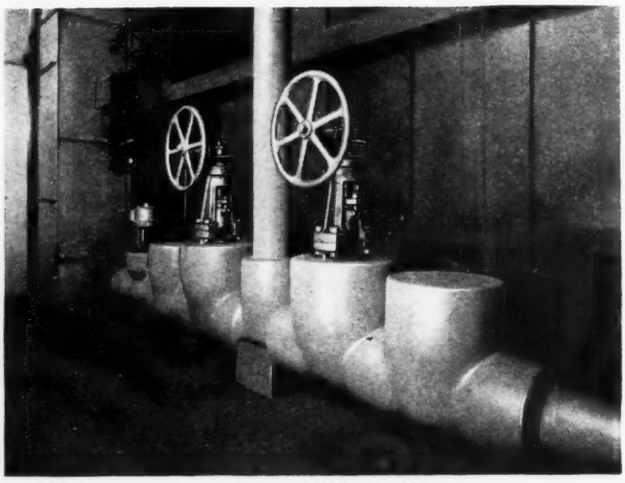
The ROTO Company

Tube Cleaner Specialists Since 1910

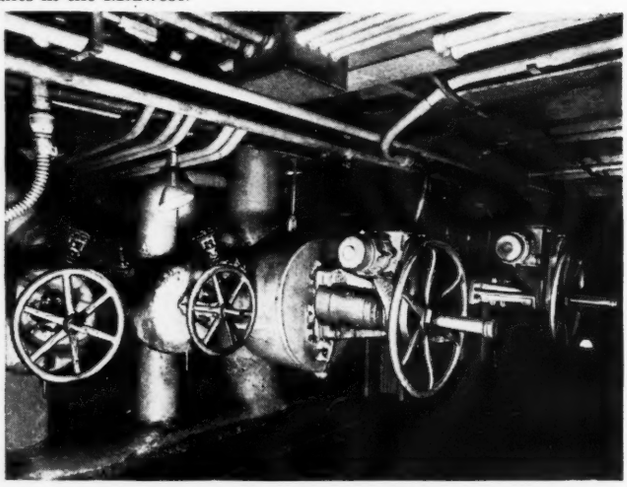
145 SUSSEX AVENUE **NEWARK, N. J.**

Send for bulletin covering your specific requirement

POWELL *has*



● Powell Class 900 pound cast steel Gate and Check Valves on high pressure boiler feed lines in one of the most modern power plants in the Midwest.



● High-pressure, high temperature steam lines equipped with Powell Class 900 pound cast steel motor and hand-operated Gate Valves.

The history of the Powell Line is written in the amazing evolution of American Industry, because for nearly a century Powell has been meeting and satisfying every demand imposed by each new process or development in the industrial world. Naturally this includes the field of Power.

Big valves, little valves . . . valves for high pressures, low pressures . . . for varying temperatures . . . for corrosion resistance. Globes, gates, checks, reliefs, non-returns, Ys, angles . . . in iron, steel, bronze and special alloys—*Powell has them all.*

Shown here are a few examples of the many Powell Valves evolved by our Research Engineering Staff to meet some particular requirement. Having completely fulfilled it, they have taken their place in the Powell line.

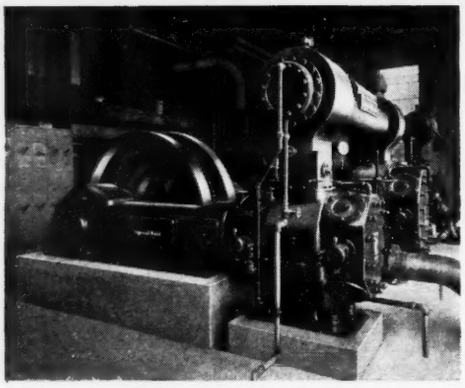
Today, for every known demand, Powell has the answer. And, as new problems arise in the future, Powell Engineering will be ready and able to solve them. In either case Powell Quality costs no more in the beginning and saves in the long run.

The Wm. Powell Co.
Dependable Valves since 1846
Cincinnati, Ohio

POWELL

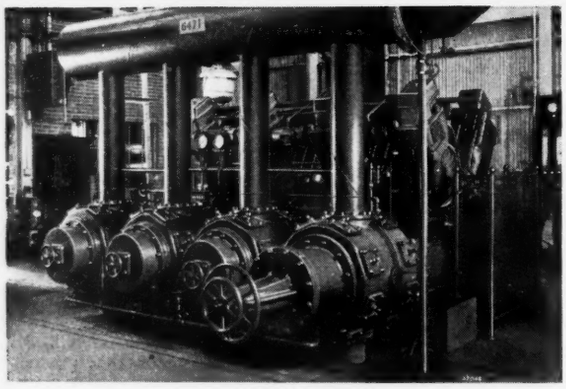
them all
POWELL
POWELL PATENT WHITE WSP
POWELL 900 STEEL
U S 125 WSP
POWELL B-1500 STEEL
POWELL 300 STEEL
VALVES

HEAVY DUTY COMPRESSORS



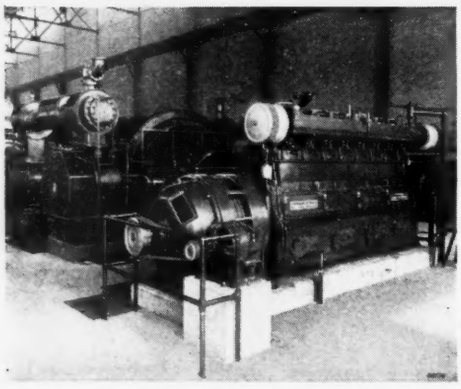
The I-R line of compressors is complete, embodying more than 1000 sizes and types. Sizes range from ¼ to 3000 hp, pressures from vacuums to 15,000 lbs. There is a machine to meet any capacity and pressure requirement for air, gases and ammonia, and for electric, steam, gas and oil engine and belt drive.

ENGINE DRIVEN COMPRESSORS



The XVO possesses higher operating economy and a much lower upkeep cost than any other Diesel-engine-driven compressor ever produced by I-R. It is built for twenty-four-hour continuous service. Standard units for 100 lbs. pressure are available in capacities of 335, 700, 1075 and 1450 cfm actually delivered.

DIESEL AND GAS ENGINES

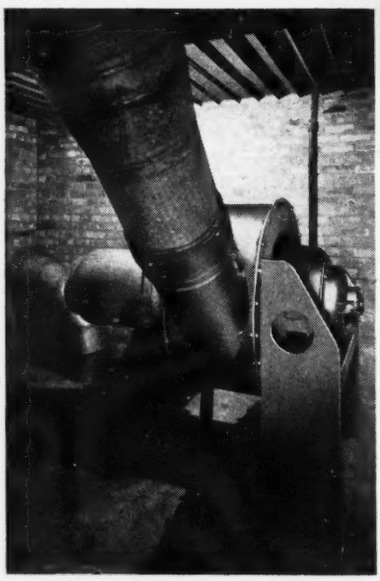


Diesel and gas engines four-cycle construction for driving generators, pumps, blowers and line shafting. Diesel engines in 3 to 8 cylider sizes for loads from 225 to 600 hp. Gas engines are built in 4, 6 and 8 cylinder sizes for loads from 185 to 800 hp. We can also furnish all engine accessories: silencers, filters, pumps, heat exchangers, etc.

"We are in the p men who d DOING THE I

● To talk about the "battle of production" and the need for more power from less fuel, and the vital need for dependable equipment, is simply to tell American plant engineers what they already know. There is no time now for fine phrases and idle claims. We may well be "doing the impossible"—but we'll have to do MANY TIMES BETTER THAN THAT before we can stop to pat ourselves on the back . . . It is with these facts clearly in mind that we list and illustrate here some of the outstanding I-R Equipment

MOTOR BLOWER



A complete line of blowers for relatively low discharge pressure and for handling large volumes of air or gas. Steam turbine or electric-motor drive is usually employed.

Motorblowers: Type G for pressures of ½ to 2¼ lbs. and volumes from 100 to 4500 cfm. Type FS for pressures of ¾ to 3 lbs. and volumes from 650 to 16,600 cfm.

Turbo Blowers: Built in sizes up to 14,500 hp with capacities to 100,000 cfm for a wide range of pressures.

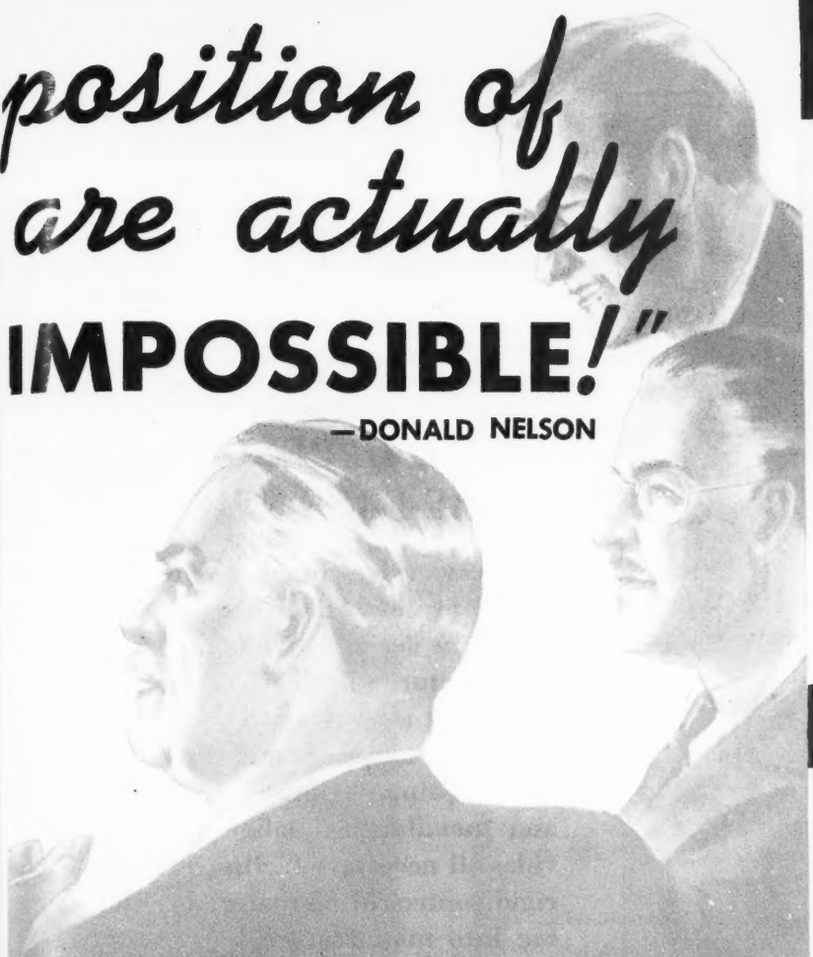
Atlanta
Birmingham
Boston
Buffalo
Butte
Chicago
Cincinnati
Cleveland
Dallas
Denver
Detroit
Duluth
El Paso
Hartford
Houston
Kansas City

Ingerso

For Canada refer—Canadian Ingersoll-Rand Company, Limited, New Birks Bldg., Phillips Square, Montreal

position of are actually IMPOSSIBLE!"

—DONALD NELSON

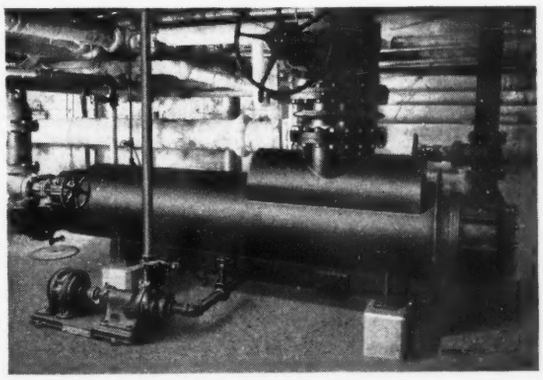


that is working to help American Industry FIGHT THIS WAR in virtually every branch of war-time industrial production. Bulletins and other data are available on all equipment shown, and will be sent promptly upon request. The further advisory services of I-R Engineers may be called upon freely to help solve any special problems.

All plants of Ingersoll-Rand Company are flying the Army-Navy "E" award for "high achievement in the production of war materials."

CONDENSERS

I-R makes all types of steam condensing apparatus and related equipment. Surface condensers range from 200 to 160,000 kw capacity. Barometric condensers available in the Disc-Flow and Ejector-Jet types. All condenser auxiliaries are designed and built by I-R. These include circulating water pumps, air ejectors, inter and after condensers.



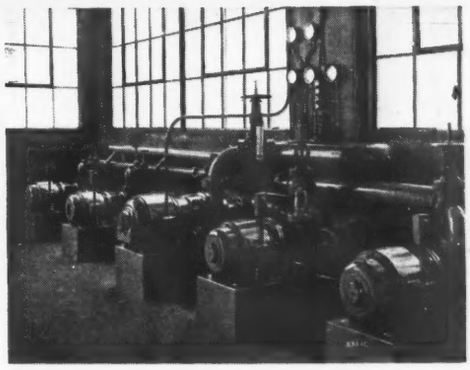
Ingersoll-Rand

11 BROADWAY, NEW YORK CITY

Knoxville, Los Angeles, Newark, New Orleans, New York, Philadelphia, Picher, Pittsburgh, Pottsville, Salt Lake City, San Francisco, Scranton, Seattle, St. Louis, Tulsa, Washington

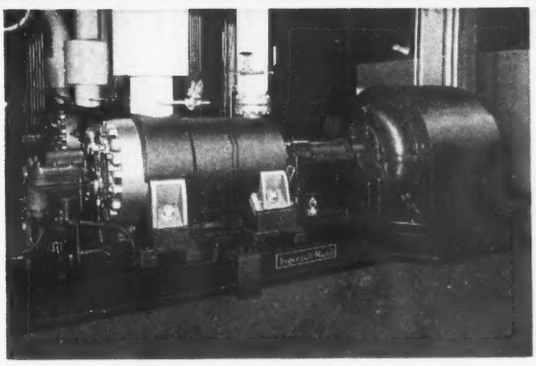
Branches or Distributors in principal cities the world over

The Cameron MOTORPUMP



The Motorpump is a twenty-four hour a day pumping unit. Pump and motor are built together on the same shaft, making it unusually compact and rigid. It is available with motors from ¼ to 40 hp to handle from 5 to 1800 gpm against pressures as high as 215 psi.

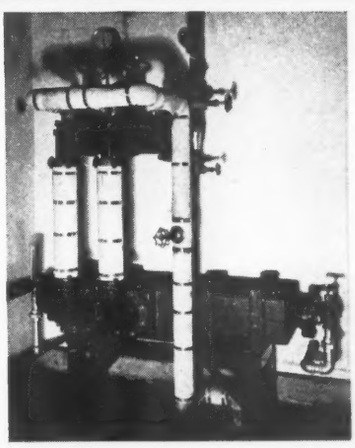
BOILER FEED PUMPS



Regardless of the size of your plant or the boiler pressure, I-R builds a feedwater pump to meet efficiently your exact conditions. In addition, there is a complete line of pumps for water circulation, condensate and general industrial requirements.

STEAM JET EJECTORS

A steam jet ejector is one of the simplest methods for removing air, gases and vapors from condensers, vacuum chambers and industrial processes. There are no moving parts. Ingersoll-Rand can furnish ejectors for practically any capacity and for vacuums up to one millimeter Hg absolute.



PNEUMATIC TOOLS

A complete line for maintenance and repair work:

Air Motors	Drills	Riveting Hammers	Tampers
Air Motor Hoists	Grinders	Sand Rammers	Weld Flux Scalers
Calking Hammers	Hoists	Scaling Tools	Wood Borers
Chipping Hammers	Nut-Runners	Spade and Diggers	Impact Wrenches
Concrete Vibrators	Rivet Busters	Sump Pumps	

YOU CAN BANK ON FAIRBANKS

FIG. 0601
Bronze Check

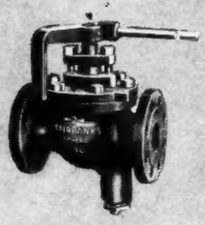


FIG. 0851
Ball-Plug Type

FIG. 0250
Bronze Gate

FIG. 0702
Iron Body Check

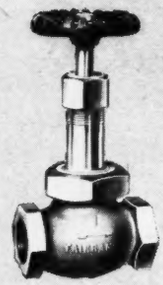


FIG. U-01
Bronze Globe,
Union Bonnet

FIG. 0501-P
Bronze Regrinding
Globe

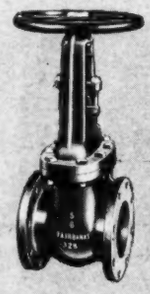


FIG. 0405
Iron Body Gate

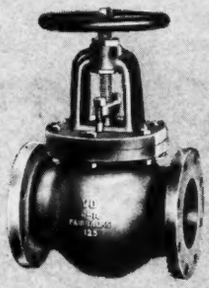
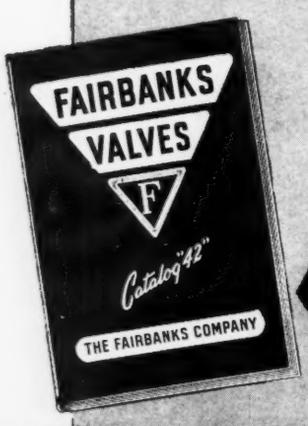


FIG. 0102
Iron Body Globe

FIG. 0418
U-Bolt
All-Iron Gate



Write for Catalog 42
Covering Complete Line

FOR VALVES THAT GIVE LONGER, MORE DEPENDABLE, CARE-FREE SERVICE

Every valve in the Fairbanks line represents many years' experience in design, development and manufacture. Each is carefully inspected at every step in production to insure accuracy and finish. A fully equipped physical, chemical and metallurgical laboratory provides all necessary facilities for the rigid control of all materials entering into manufacture.

Fairbanks assures prompt service through conveniently located supply houses in all leading industrial centers. Factory trained engineers are available to help you solve special valve problems.

You can "Bank on Fairbanks" valves for the maximum in service and performance as well as high quality at the right price.

Fairbanks Valves are made in globe, angle, check and ball types —in both bronze and iron—for practically every steam, water, air, oil and acid condition. Standard and extra heavy pressures.

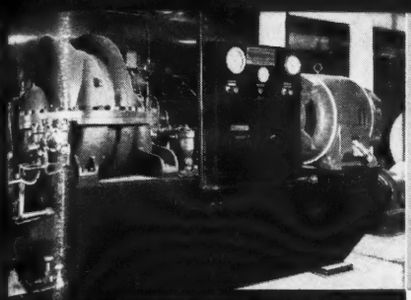
THE FAIRBANKS COMPANY

397 Lafayette St. New York, N. Y.
Boston, Mass., Pittsburgh, Pa.

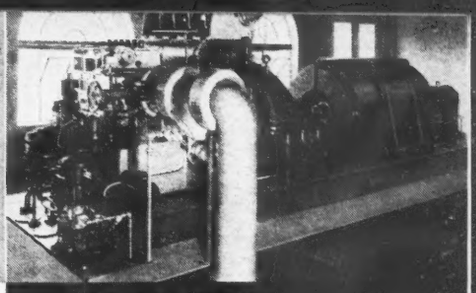
Fairbanks *Standard and Renewable* Valves

WORTHINGTON

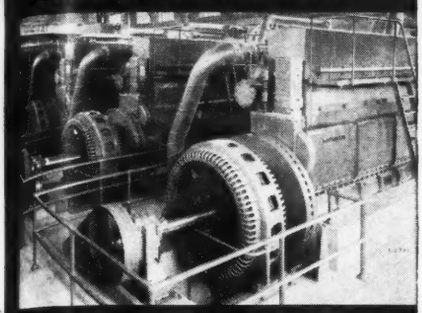
EQUIPMENT FOR POWER GENERATION



Centrifugal refrigerating compressor, water cooler, water-cooled condenser combined

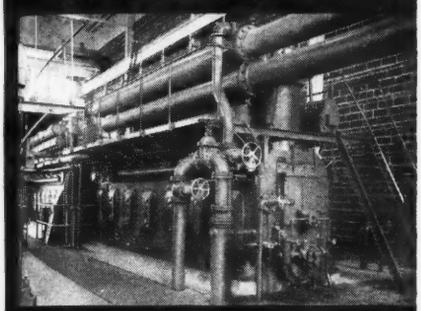


Steam turbo-generator unit in municipal power and light service

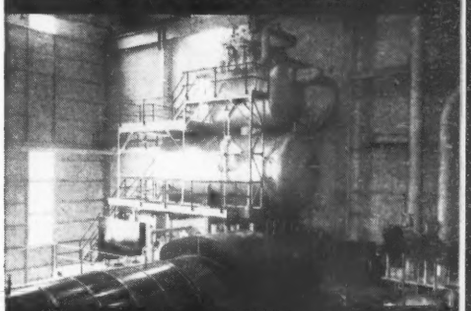


Five diesel engines generating electric power for a western cooperative

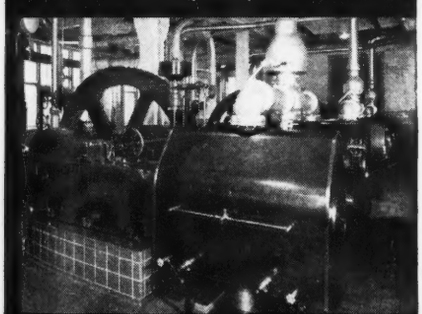
A 73,000 square foot surface condenser installed in a large airplane plant



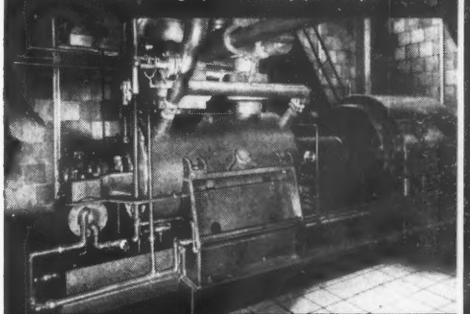
A 1500-horsepower vertical gas engine in a southern power plant



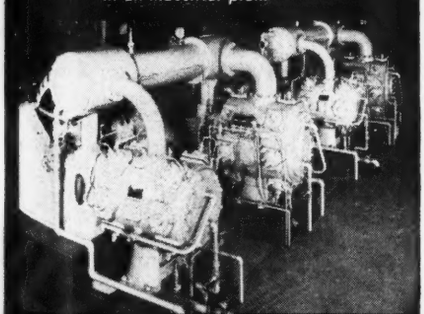
Stationary feedwater heater in the turbine room of a large public utility power plant



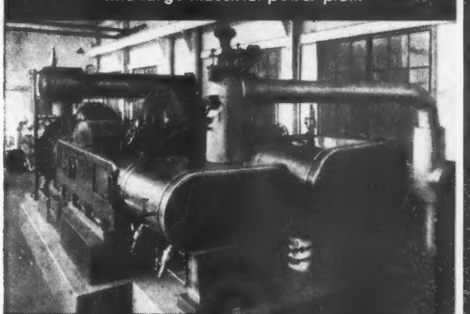
Steam driven refrigerating compressors in an industrial plant



High-pressure centrifugal boiler feed pump in a large industrial power plant



Two motor driven air compressors serving a western airplane motor plant



Steam engine driven compressor for general air supply in a large process plant

★

STEAM TURBO-GENERATOR UNITS
All types up to 7500 kw.

MULTI-STAGE STEAM TURBINES
All types 25 hp. to 10,000 hp.

SINGLE-STAGE STEAM TURBINES
Up to 2500 hp.

COMBINED STEAM TURBINE AND REDUCING GEAR UNITS
5 hp. to 200 hp.

REDUCING AND INCREASING GEARS

DIESEL ENGINES
150 hp. to 1500 hp.

GAS ENGINES
175 hp. to 2880 hp.

CONVERTIBLE GAS-DIESEL ENGINES
150 hp. to 1500 hp.

STEAM CONDENSERS
Of all capacities, With all auxiliaries.

STEAM JET EJECTORS
For moderate to high vacuum service.

CENTRIFUGAL BOILER FEED PUMPS
For medium and high-pressure service.

CENTRIFUGAL GENERAL SERVICE PUMPS
For every required application.

AIR AND GAS COMPRESSORS
For small, medium and large air supply. Steam, motor or engine driven.

FEEDWATER HEATERS AND DE-AERATORS
Open type, for individual requirements.

WATER PURIFICATION EQUIPMENT
Pressure and gravity type filters.

REFRIGERATING AND AIR CONDITIONING EQUIPMENT

TURBINE WELL PUMPS
For general, sump and other services.

STEAM, POWER AND ROTARY PUMPS
For boiler feed and varied services.

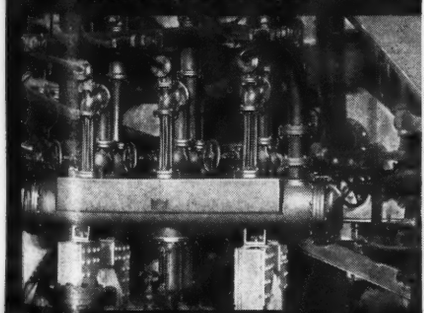
LIQUID METERS
All types; hot or cold water, chemicals, etc.

V-BELT DRIVES
Complete drives, sheaves or belts only.

PORTABLE COMPRESSORS AND AIR TOOLS
For new construction and maintenance service.

★

IC2-41



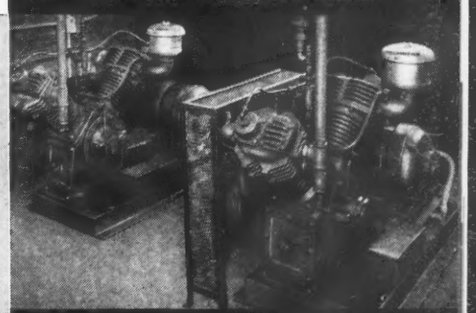
Steam-jet air ejectors for high vacuum service in power and process plants

A complete coverage for every important power plant function

WORTHINGTON PUMP AND MACHINERY CORPORATION

General Offices: **HARRISON, NEW JERSEY**

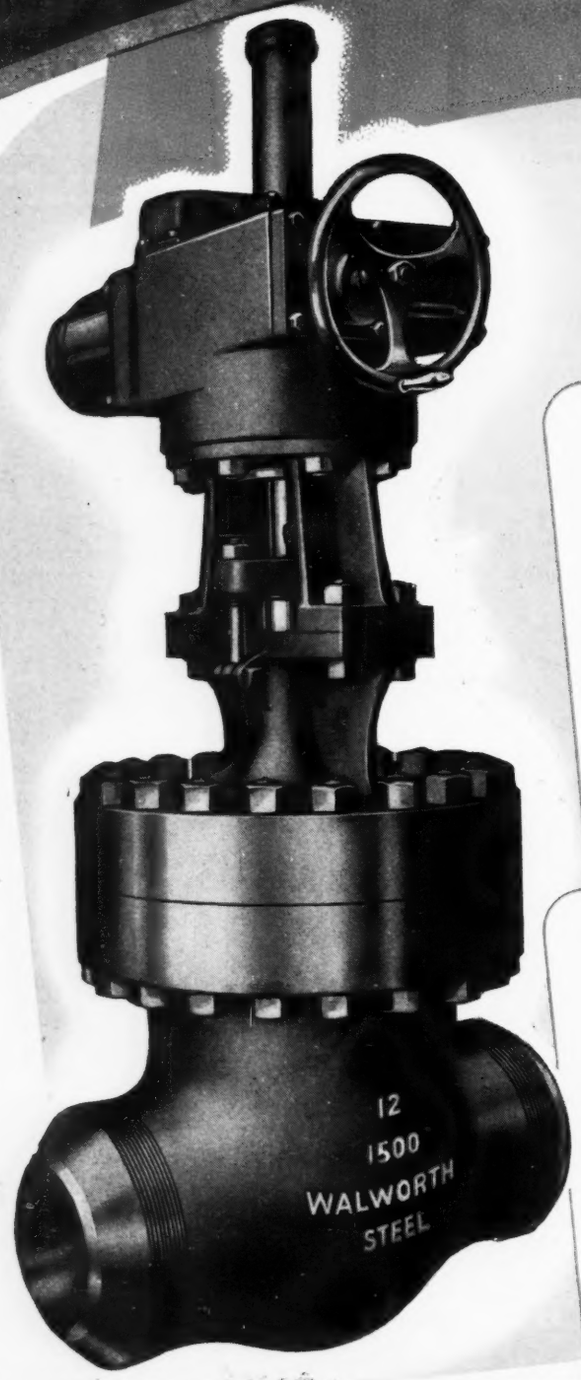
Offices and Representatives in Principal Cities

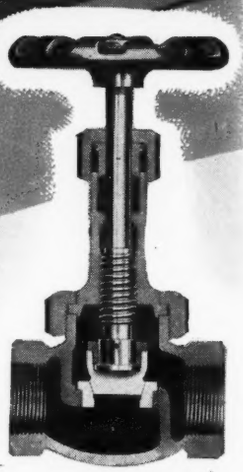


Two angle type compressors for small and medium air supply

WALWORTH

VALVES FITTINGS for TOOLS





BRONZE VALVES

Gate, Globe, Angle and Check—These Walworth types are made for all pressures, temperatures, and services for which bronze valves are suitable. Walworth No. 225P Globe Valve, illustrated, has a stainless steel, plug type, seat and disc, heat treated to a minimum of 500 Brinell hardness. Boiler scale, sand, grit, and other foreign particles cannot mar the surface of either the seat or disc. Wire-drawing is practically eliminated. Extra large stems and long stem threads have been provided to decrease thread wear and increase valve life. Every part has been designed to assure maximum protection against wear and leakage. For complete information regarding Bronze Valves refer to Walworth Catalog 42, Sections 2-6.

CAST STEEL VALVES

Illustrated at the left is a 12", 1500 lb. Walworth Steel Valve with welding ends. Walworth Steel Valves in all series can be furnished with welding ends, screwed ends, or flanged ends within the limits of war production. The complete line of Cast Steel Valves, in Gate and Globe types, have extra strength and protection due to heavy walls. Deep stuffing boxes eliminate costly leaks. Flow loss at high velocity is decreased by streamlined ports. Every detail of design, metallurgy, and construction helps to assure better and longer service. See Sections 16-17 of Walworth Catalog 42 for complete data on Cast Steel Valves.

WALWORTH

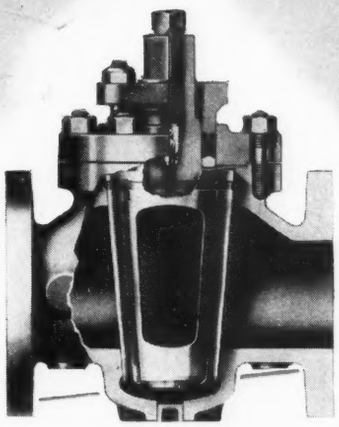
WALWORTH COMPANY
60 EAST 42nd STREET, NEW YORK

VALVES FITTINGS and TOOLS
Backed by 100 Years' Service

DISTRIBUTORS IN PRINCIPAL CENTERS THROUGHOUT THE WORLD

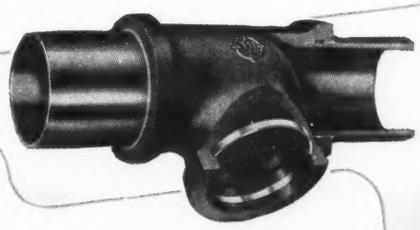
STEAM · OIL · WATER · GAS · AIR

and other liquids and gases



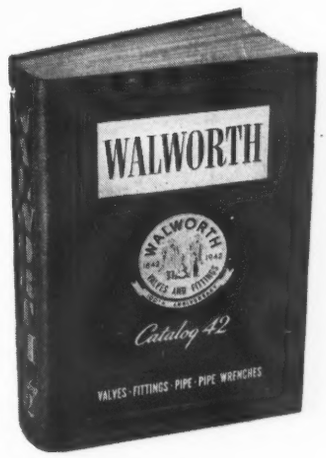
LUBRICATED PLUG VALVES

Some fluids are difficult to control with conventional types of valves – but Walworth Lubricated Plug Valves do the job safely and easily. They may be opened or closed with but a quarter turn of the handle, and have proved their ability to give a dead-tight shut-off. Operation is sure and smooth. All these qualities plus greater protection against corrosion and erosion make Walworth Lubricated Plug Valves ideal for "difficult" jobs. They are made in sizes from ½ to 24-inches and for pressures from 125 to 5000 lbs. Complete information on Lubricated Plug Valves will be found in Section 15 of the new Walworth Catalog.



WALSEAL FITTINGS

For Leakproof "One-piece" Copper or Brass Pipe Lines – Walseal Fittings are threadless bronze fittings into the ports of which the exact amount of silver brazing alloy has been inserted by Walworth at the time of manufacture. Joints are made by inserting the pipe end into the fitting port, then heating both pipe and fittings with an oxyacetylene flame. The result is a *Silbraz Joint* which saves time and effort, and which is silver-brazed – not soft soldered. A brass or copper line made up with Walseal Valves and Fittings is actually a "one-piece" line, leakproof, vibration-proof, shock-proof, and corrosion-resistant. Refer to Section 20 of Walworth Catalog 42 for complete information on Walseal Fittings.



SPECIFY FROM THE NEW WALWORTH CATALOG 42

The new Walworth Catalog 42 is just off the press. It gives the latest information on any question concerning Walworth products. It is clearly indexed and contains complete up-to-date data on valves, fittings, and pipe, including working and test pressures, plus service recommendations. Conformity of metals to A.S.T.M., Marine, and U. S. Navy specifications is given in detail. Dimensions for layout and operation, as well as engineering data, make valve and pipe installations easier and add to the usefulness of this new Walworth Catalog 42. Be sure to get a copy. Fill out and attach the handy coupon to your letterhead.

Please send a copy of the new Walworth Catalog 42 to:

*Name*_____

*Title*_____

*Company*_____

*Address*_____

*City*_____ *State*_____

One hundred years ago Walworth first manufactured valves and fittings. Walworth has been manufacturing these products continuously ever since.

WALWORTH 1842 1942 VALVES AND FITTINGS 100TH ANNIVERSARY

RODA — High grade gas, by-product and steam coal from Wise County, Va., on the Interstate Railroad.

DENDRON — High grade gas, by-product, steam and domestic coal from Wise County, Va., on the Interstate Railroad.

STONEGA — High grade, high volatile steam and by-product coal from Wise County, Va., on the Interstate Railroad.

PREMIX STOKER — A laboratory controlled product blended to meet exacting stoker requirements. From Wise County, Va., on the Interstate Railroad.

COKE — Roda and Stonega from Wise County, Va., and Connellsville Coke from Pennsylvania.

CRITERION COAL — High grade gas, by-product, steam and domestic coal—Pittsburgh seam from Irwin Basin, Westmoreland County, Pennsylvania, on the Penna. Railroad.

CROZER — Genuine Third Vein Pocahontas from McDowell County, W. Va., on the Norfolk & Western Railroad.

Admiralty Coal — Genuine New River Smokeless, Beckley or Sewell seam from Raleigh County, W. Va.. C. & O. and Virginian Railroads.

Old Kentucky — Hazard No. 4 and No. 7 steam and domestic coal from Wiscoal, Knott County, Kentucky, on the L. & N. Railroad.

GENCO — Steam and domestic coals from a number of producing districts.

ANTHRACITE — Premium and standard qualities in the entire range of Anthracite burning characteristics.

Capable engineering personnel and the experience gained through long and varied marketing activity assures proper application of one of the above brands and effective servicing of any fuel requirement.

General Coal Company

123 SOUTH BROAD STREET — **PHILADELPHIA, PA.**

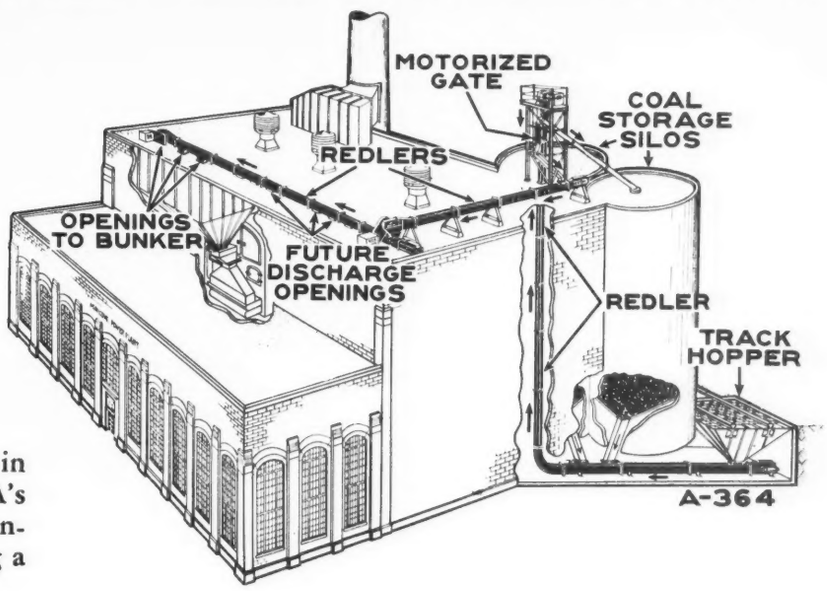
Branches

BLUEFIELD, W. VA.
BOSTON
BUFFALO
CHARLESTON
CHARLOTTE, N. C.
CINCINNATI
DETROIT
NEW YORK
NORFOLK
PITTSBURGH

MOBILIZING COAL

REDLER CONVEYOR-ELEVATORS

Section through the REDLER Conveyor-Elevator—Coal flows enmasse in a solid column wherever the enclosed, weather-proof casing carries it.



For an Endless Flow of Power

● Coal "on the march" is a vital factor in the national mobilization for total war. S-A's exclusive Redler Conveyor-Elevators on hundreds of jobs all over the country are playing a big part in the national "movement."

In the example illustrated here the material moved is coal—from track to bunker in a municipal power plant—without dust, dirt or obstruction of useful space. Notice how the roof is used, to locate discharge openings above each bunker. Particularly unique is the way a single Redler conveys and elevates to and from silo storage.

The automatic result of such an installation is a constant uniform supply to every bunker—with a minimum of human effort and supervision.

STEPHENS-ADAMSON MFG. CO.

5 Ridgeway Avenue, Aurora, Illinois

Los Angeles, Cal. Belleville, Ont.

STEPHEN S-A DAMSON MFG. CO.

Chains and Sprockets	Belt Conveyors		Bucket Elevators	Crushers
Bin Gates	Pan Conveyors	SealMaster	Feeders	Screens
Speed Reducers	Redler Conveyors	Ball Bearings	Skip-Hoists	Winches and Car Pullers

GUARD YOUR

● It's a smart man who uses whatever controls he can to ease the load on valves in his power process and service lines—who gets on top of the valve maintenance job and stays there.

For a time, it's going to be tougher to get new valves and replacement parts. War production has reached a peak at valve manufacturing plants and the situation is further complicated by increasing scarcity of critical materials.

We wish it were different. We rather would be offering to supply you with valves you need. But now, with troops on the move—our troops—is no time for anyone to give less than *everything* to the needs of Army and Navy. You serve, then, by taking every precaution to guard the valves you've got.

READING-PRATT & CADY

MANUFACTURERS OF
READING CAST STEEL VALVES & FITTINGS • PRATT & CADY BRASS & IRON VALVES
D'ESTE VALVE AND ENGINEERING SPECIALTIES

READING, PA., ATLANTA, BOSTON, CHICAGO, HOUSTON, LOS ANGELES, NEW YORK, PHILADELPHIA, PITTSBURGH, SAN FRANCISCO

A Division of AMERICAN CHAIN & CABLE COMPANY, INC.

DON'T REPLACE
Your Worn Bronze Valves
...—Renew Them
SAVE THIS VITAL METAL
READING-PRATT & CADY
APR.
...Save ALL THAT BRONZE
READING-PRATT & CADY MADE IT POSSIBLE FOR YOU TO RENEW BRONZE VALVES INSTEAD OF REPLACING THEM
1861—PRATT & CADY INVENT GLOBE VALVE WITH RENEWABLE SEAT AND DISC
MAY
FOR WANT OF A VALVE
For want of a valve, steam, was lost
For want of steam, metal was lost
For want of metal, a plane was lost
For want of a plane, a fortress was lost!
READING-PRATT & CADY
READING, PENNSYLVANIA
1865
VALVES!
Even before Pearl Harbor Reading-Pratt & Cady has been emphasizing the shortage of valves and materials for them.
January:
This advertisement was written before Pearl Harbor. It tells us:
"Materials are scarce. Replace worn parts."
February:
We pointed out that we were the originators of renewable features and suggested you take advantage of this and not buy new valves.
March:
"Don't replace your worn bronze valves—renew them."
April:
"Save all that bronze."
May:
"Use it, mend it, make it do."
June:
"Swing to alternative materials for the duration."
July:
"Men no longer clamor that . . . nickel, chromium and brass be delivered for civilian use."
August:
"The (production) problem is complicated by certain shortages."
September:
"Protect the valves you've got."
October:
"Guard those valves."
• BRIDGEPORT, CONNECTICUT
JULY
USE THIS READING-PRATT & CADY VALVE
AS PART OF YOUR PROGRAM TO SWING TO ALTERNATIVE MATERIALS FOR THE DURATION
READING-PRATT & CADY
JUNE
LOYALTY IS NOT TAGGED WITH THE PRICE OF BRASS
READING-PRATT & CADY
A Division of AMERICAN CHAIN & CABLE COMPANY, INC.
ACCO

DE LAVAL'S DUAL PROTECTION

Helps Keep Power Units on the Job

DE LAVAL Oil Purifiers keep turbines and engines free from the *two* great sources of lubricating trouble: *Water* which can lead to oil failure and which also accelerates sludge formation; and *dirt* which causes excessive wear on bearings and other moving parts and in extreme cases may shut off the oil supply.

Positive and continuous centrifugal purification of lubricating oil by means of a De Laval machine is a particularly important factor in power plant operation today, when practically every power unit is loaded to capacity and is virtually irreplaceable.

Ask for Bulletin No. 106 containing additional details. No obligation.

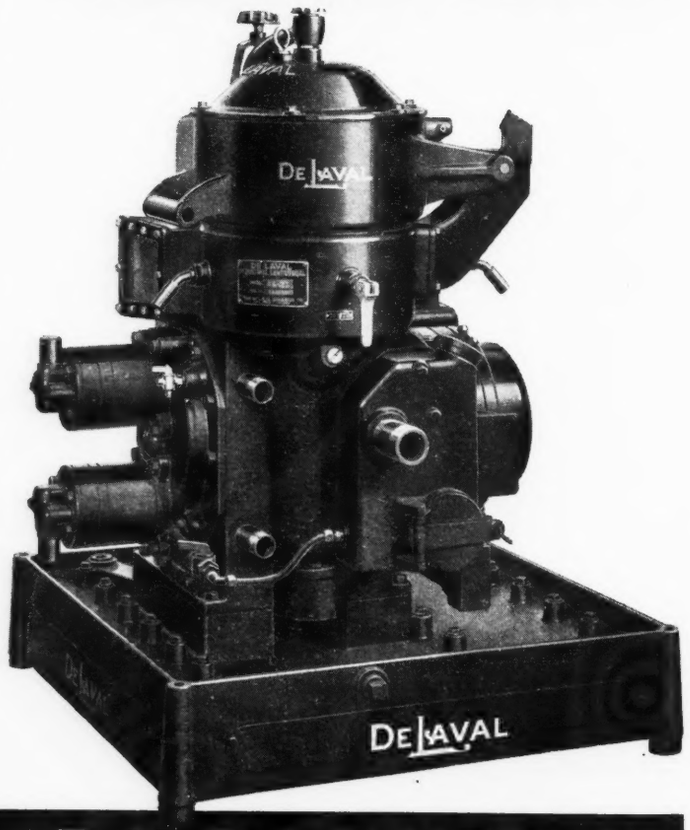
THE DE LAVAL SEPARATOR COMPANY

165 Broadway, New York — 427 Randolph St., Chicago

DE LAVAL PACIFIC CO., 61 Beale St., San Francisco

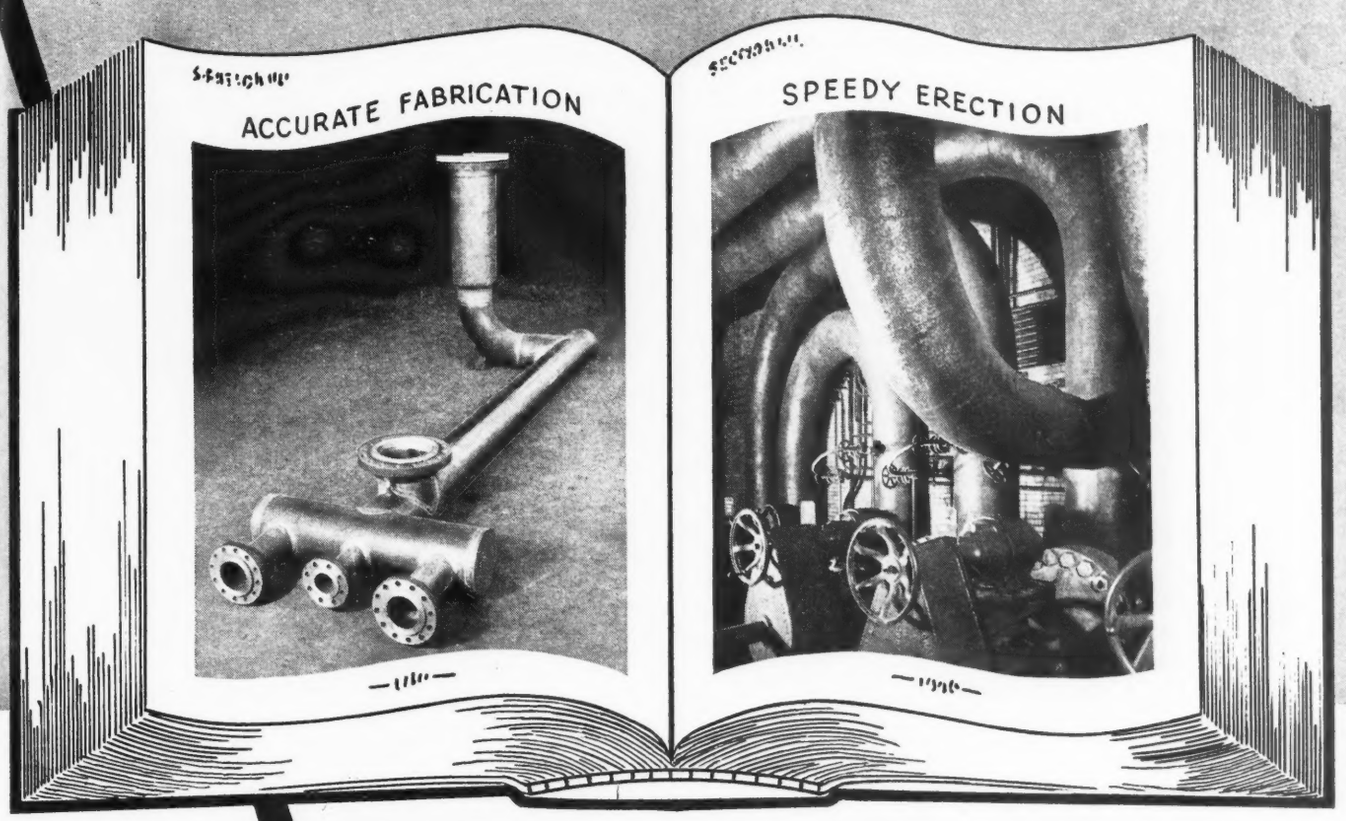
THE DE LAVAL COMPANY, Limited

Montreal — Peterborough — Winnipeg — Vancouver



DE LAVAL OIL PURIFIERS

COMPLETE PIPING SERVICE



PITTSBURGH PIPING'S FABRICATING FACILITIES ARE GEARED TO THE DEMANDS OF PAPER MILL PIPING REQUIREMENTS

FABRICATION AND ERECTION OF COMPLETE PIPING SYSTEMS

Carbon-Moly Piping	Forged Piping Materials
Carbon Steel Piping	Headers
Cast Iron Fittings	Manifolds
Cast Steel Fittings	Pipe Bends
Chrome-Moly Piping	Stainless Steel Piping
Copper Piping	Stainless Steel Tanks and Vats
Corrugated Piping	Valves
Creased Bends	Welded Stainless Steel Tubing
Expansion Bends	Welded Fittings
Flanges	Wrought Iron Piping

PITTSBURGH Piping is thoroughly familiar with problems peculiar to the paper industry, and has the facilities to furnish all types of piping for efficient plant operation. The list at the left, while far from complete, shows the most often used types of piping furnished for power and process lines.

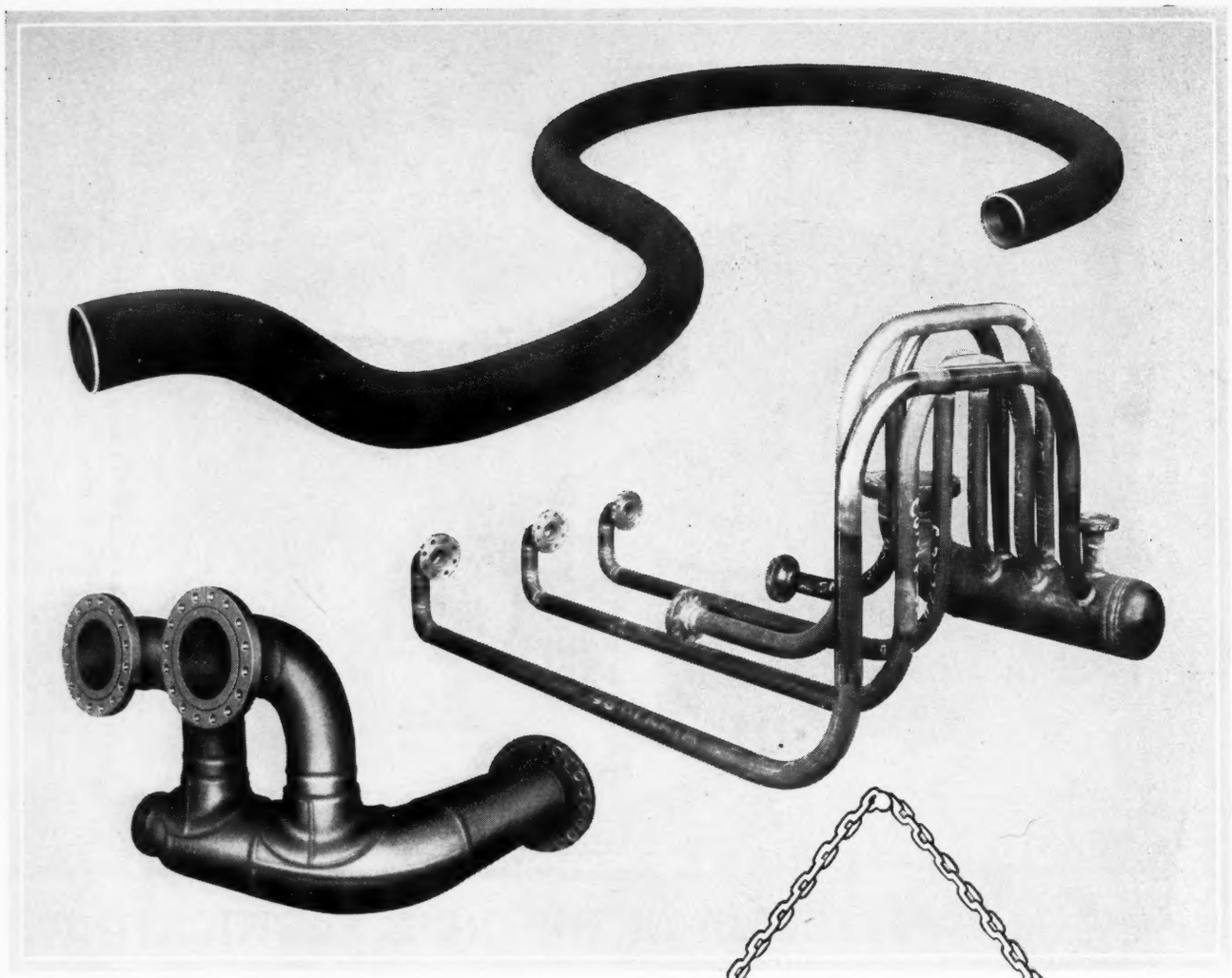
In its 5 acre plant, Pittsburgh Piping has facilities for engineering and producing piping for central stations, industrial and process plants. Here is modern equipment for bending, welding, flanging, machining, heat treating, and hydraulic testing. Not only is time saved by pre-fabricating assemblies as large as shipping and erection limitations permit, but all operations can be checked and inspected for insurance before shipping.

For speedy and efficient erection, Pittsburgh Piping has specially trained field crews who maintain their schedules without interfering with other subcontractors. All assemblies are scheduled through the shop in the required sequence for erection in the field. This integration of fabrication and erection has been developed to a point where, even under present-day conditions, deliveries of completed piping can be made in a minimum of time. If you need a single pipe or a complete system, address your nearest Pittsburgh Piping office.

Buy War Bonds and Stamps

PITTSBURGH PIPING & EQUIPMENT CO., 10 FORTY-THIRD ST., PITTSBURGH, PA.

Woolworth Building, New York
Public Square Building, Cleveland
Occidental Building, Indianapolis
10 High Street, Boston
Peoples Gas Building, Chicago
Union Guardian Building, Detroit
525 Market Street, San Francisco



THE more experience which can be brought to bear on a problem, the more certain it is that the solution will be satisfactory. There is no substitute for experience.

When you obtain your piping from a qualified fabricator, you receive the benefit of long and varied experience. P.F.I. members handle every type of piping job, year after year, and have accumulated a wealth of experience in every field where piping is used. Continuous piping research substantially supplements this experience.

The specialized experience enables the qualified fabricator to contribute suggestions which assure piping sub-assemblies that are commercially practical. Each subassembly is carefully shop tested, accurately aligned, preheated and stress relieved when necessary, and thoroughly cleaned and inspected. Difficult welding is done by qualified welders in well equipped shops using special machinery to assure its quality. Field work is reduced to fewest and simplest operations.

THE PIPE FABRICATION INSTITUTE

P.F.I. THE PIPE FABRICATION INSTITUTE

Devoted to the Technical and Economic Problems in Piping

1108 CLARK BUILDING, PITTSBURGH, PA.

"CONDENSER SERVICE"

. . . . . Available any time,
any place, in any emergency
24 HOURS A DAY - 7 DAYS A WEEK
all year 'round

EXAMPLES OF OUR SERVICE:

78 highest-classification surface condensers shipped from one plant in a single month.

•

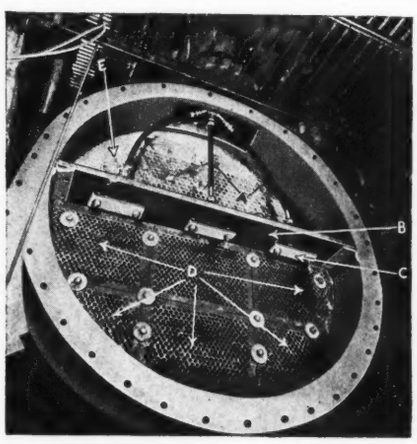
Air & erosion eliminators installed in condensers in 8 to 36 hours, depending upon the size of the condenser. From past experience, a re-tubed condenser fitted with these screen plates will show 2 to 7 times previous tube life.

•

New tube sheets, for six emergency jobs, cut, drilled and ready to install in 36 to 48 hours.

•

When steam condensers hold up a job anywhere, 'phone our number, Hoboken 3-4425. Almost all "impossible" emergencies can be handled to your complete satisfaction.



Air and erosion eliminator installation in large power plant condenser. Liberates entrained air in circulating water, saves tube sheets and tubes.

OUR COMPANY, ITS ACTIVITIES AND FACILITIES

Condenser Service & Engineering Company offers to users of heat exchange equipment a rounded, complete service in design engineering, fabrication, preventative and ordinary maintenance, repair, re-design and re-building of new, current and obsolete units.

OUR SERVICE:

1. Design, construction and earliest delivery of the condensers and heat exchangers released to us as essential to war production.
2. Preventative Maintenance for condensing equipment in operation. For example: Air & Erosion eliminators to save tube sheets and tubes. Flowrites to preserve tube ends. Shock-testing, to eliminate only defective tubes, select good tubes for double life. Stretching of tubes and expert re-conditioning of tube ends. Wizard condenser Injectors for stopping leaks.
3. Ordinary Maintenance. Field service for cleaning, re-tubing, re-packing, replacement. Any time, anywhere in North America.
4. Modernization of obsolete equipment. One of the three CS&E plants is equipped to re-design and rebuild any obsolescent heat exchange unit to bring it up to modern performance.

OUR PRODUCTS:

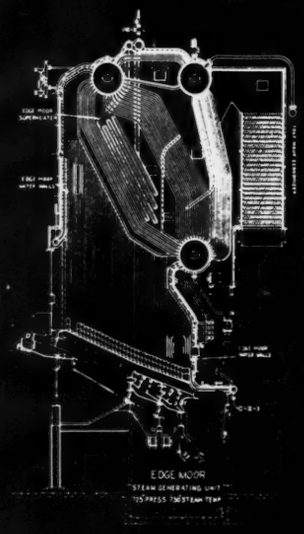
Surface Condensers—Feed Water Heaters—Deaerating Heaters—Steam Jet Air Ejectors—Fuel Oil Heaters—Lube Oil Coolers — Drain Coolers — Freon Coolers — Low Pressure Evaporators—Distillers—Jacket Water Coolers—Compressor Stage Coolers—Process Heat Exchangers:—Reboilers, Condensers, Coolers—Fibre Tube Plugs—Tube Packing:—Fibre and Metallic; Treated Corset Lace—Flowrites (Removable Tube Ends)—Air & Erosion Eliminators—Evaporator Coils—Feedwater Heater Coils—Universal Bevel Gears—Wizard Injectors (Stop tube leaks)—Metallizing to reclaim worn equipment—Repair and calibration of every power plant instrument—Feed Water Filters—Grease Extractor—Strainers—Sewage Ejectors.

OUR POLICY

Condenser Service & Engineering Company has, in 15 years, gained a reputation in the power plant field for "delivering the goods." Within war-born limitations, there remains our own specialized field of around-the-clock, through-the-calendar service to our customers. Our two new plants are extensions of that service: Production, and more production, for Victory.

CONDENSER SERVICE & ENGINEERING CO., INC.
310 TWELFTH STREET — HOBOKEN, NEW JERSEY

Any EDGE MOOR BOILER ALREADY BUILT CAN BE DUPLICATED *Promptly*

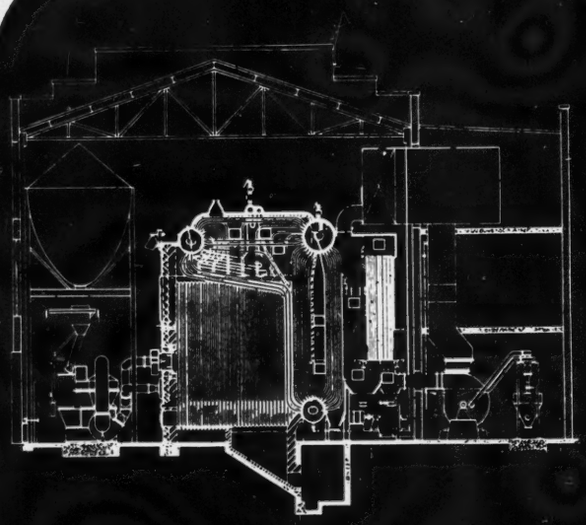


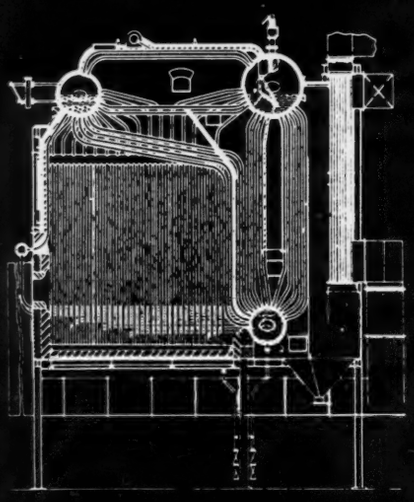
THREE DRUM BOILER

150,000 lbs. of steam per hour at 725 lbs. pressure and 750° F temperature; water walls; economizer.

RADIANT HEAT BOILER

Pulverized fuel fired; 50,000 lbs. steam per hour at 425 lbs. pressure and 700° F temperature; water walls, superheater and air preheater.



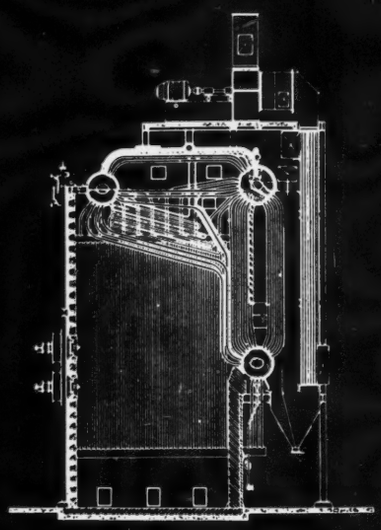


THREE DRUM RADIANT HEAT BOILER

Oil fired; 90,000 lbs. of steam per hour; arranged so that coal may be used for fuel with but slight rearranging.

RADIANT HEAT BOILER

Equipped for operation on fuel oil, natural gas or pulverized fuel, 40,000 lbs. of steam per hour at 450 lbs. pressure and 725° F temperature, air preheater, superheater.



The designs shown here are typical of those which have recently been designed, built and placed in operation by Edge Moor. Many other water tube boilers representing the most modern practice offer opportunities for prompt reproduction because all engineering work involved has been completed.

A full range of capacities and pressures is represented in these boilers in Bent Tube, Straight Tube and Waste Heat Types.

Edge Moor offers complete installation service including Boilers, Superheaters, Water Walls, Economizers and Air Preheaters.

EDGE MOOR IRON WORKS, INC. 30 ROCKEFELLER PLAZA NEW YORK, N. Y.

KANSAS CITY CHICAGO DETROIT RICHMOND, VA.

IN CANADA:— UNITED STEEL CORPORATION, LTD., TORONTO, MONTREAL

THESE are the real footsteps to Victory . . . the marching feet of fighting men, now heard across the embattled continents. Yet these men cannot fight unaided. Each step a soldier takes needs the fullest backing here at home. We must sacrifice, we must work, we must save.

Here, for example, are four very simple conservation steps which you can take on the march to final victory. Follow them and make your storage batteries last longer. Buy to last, and save to win!

STEP No 1 Keep adding approved water at regular intervals. Most kinds of local water are safe in an Exide Battery. Ask us if yours is safe.

STEP No 2 Keep the top of the battery and battery container clean and dry at all times. This will assure maximum protection of the inner parts.

STEP No 3 Keep the battery fully charged—but avoid excessive overcharge. There's always a right way to do any job, and a storage battery will last longer when charged at its proper voltage.

STEP No 4 Keep records of water additions, voltage, and gravity readings. Don't trust your memory. Write down a complete record of your battery's life history. Compare readings. Know what's happening!

If you wish more detailed information, or have a special battery problem, don't hesitate to write to Exide. We want you to get the long-life built into every Exide Battery. Ask for Booklet Form 2399.

THE ELECTRIC STORAGE BATTERY CO., Philadelphia
The World's Largest Manufacturers of Storage Batteries for Every Purpose
Exide Batteries of Canada, Limited, Toronto

Exide

BATTERIES FOR CRANKING DIESEL ENGINES

CANTON STOKER

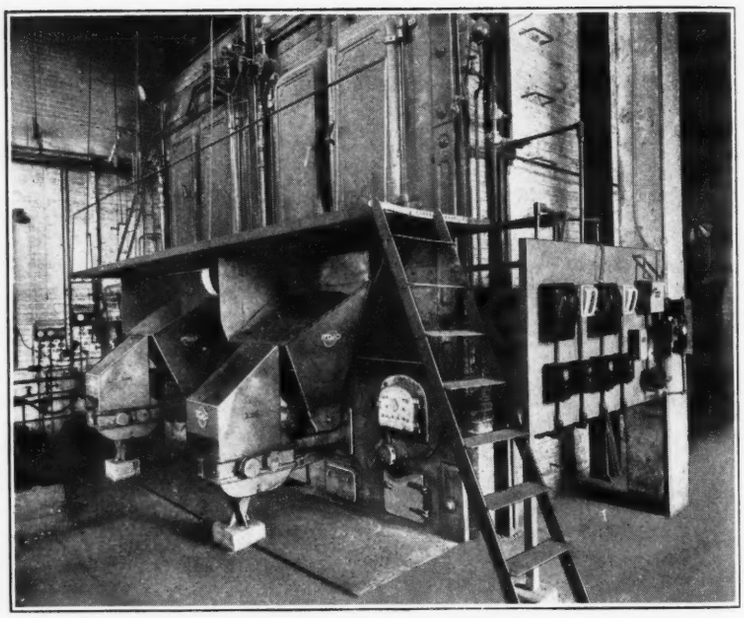
Guaranteed for Five Years!

AGAINST DEFECTS AND WEAR!

Of special interest to all stoker users . . .

● is one paragraph in the Canton Stoker specifications that reads—

"All parts outside the furnace shall be guaranteed against wear and defects for *Five Years* after the installation is made." (The average stoker is guaranteed for one year only.)



Illustrated is an installation that is showing an exceptionally high return on the original investment.

●

We can safely make this guarantee because throughout Canton Stokers, including the windbox, special alloy castings and rugged construction combine to give great strength and positive wear resistance.

Our experienced engineering organization and fully equipped plant enable us to produce stokers that perform *more* dependably with *less* attention.

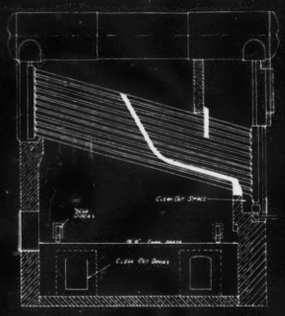
Thus, for Canton Stokers we can forecast dependable, efficient operation AND ultimate economy.

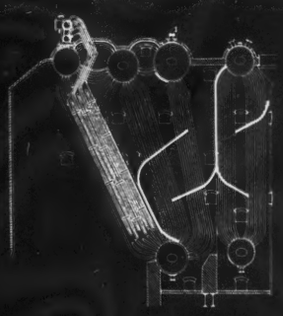
Our engineering staff and its facilities are at your disposal—to aid you in choosing the right stoker to fit your needs—to suggest changes that will increase capacity and efficiency and reduce fuel bills. Your requests and inquiries will receive our prompt attention. Write, wire, or phone today.

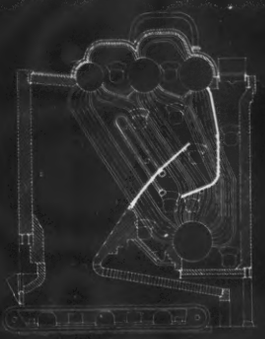
CANTON STOKER CORPORATION
ANDREW PLACE, S. W., CANTON, OHIO

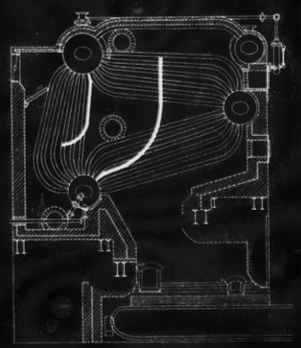
Enco Streamline Baffles

INDIVIDUALLY DESIGNED FOR ALL TYPES OF BOILERS









PRODUCED EXCLUSIVELY BY THE ENGINEER COMPANY

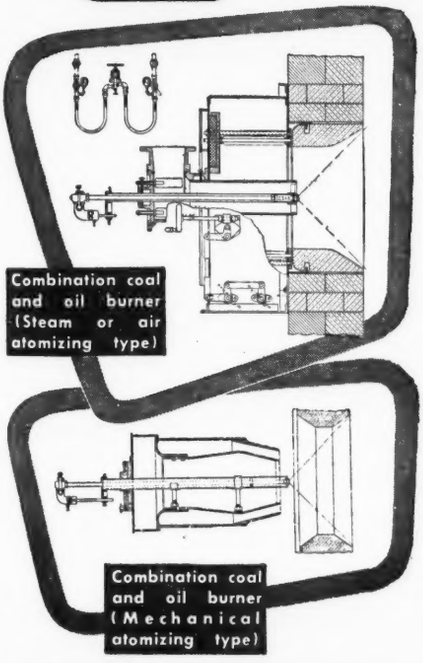
Insure better heat distribution—Minimize ash and cinder collection—Increase boiler capacity—Save steam . . .

By streamlining and curving the baffles, Enco design provides wide flexibility to meet various tube and superheater arrangements. Dead gas pockets are eliminated and the entire heating surface used more effectively, permitting higher rate of heat transfer. Steam is saved because soot blowers have less work to do and are used at less frequent intervals.

Enco Baffles are gas tight, of uniform thickness and have smoothly curved surfaces to eliminate angles and avoid eddy currents, promoting smooth flow of gases over heating surfaces.

Send for Bulletin BW-40—FREE ON REQUEST—containing valuable useful data on modern baffle wall construction.

Enco OIL BURNERS

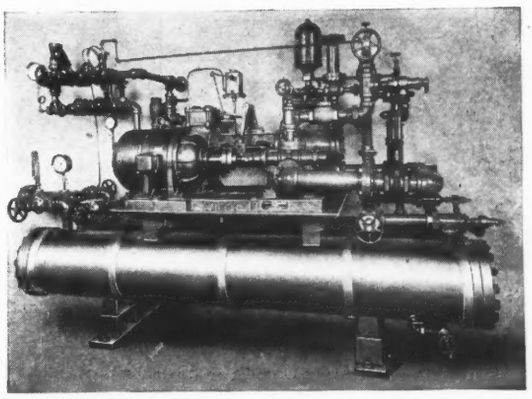

Combination coal and oil burner (Steam or air atomizing type)
Combination coal and oil burner (Mechanical atomizing type)

PROVIDE A DEPENDABLE DUAL FUEL SYSTEM

ENCO Interchangeable Mechanical, Steam and Air Atomizing Fuel Oil Burners are being applied to various types of standard pulverized coal and gas burner units to provide: ignition for pulverized coal, a fuel unit for cold starting, assurance of operation in the event of a breakdown, and a means for banked fire and low load operation. When fuel oil is available at favorable prices, fuel cost can be reduced.

Send for Bulletin giving detailed information.

Enco FUEL OIL PUMPING AND HEATING SYSTEMS



PROVIDE SAFE DELIVERY OF OIL AT PROPER TEMPERATURE AND PRESSURE

Enco Fuel Oil Pumping and Heating Units are completely built with all automatic controls for temperature, pressure and quantity of oil, with all safety protection. They are made with various arrangements of pumps and drives, and with single or duplicate heaters to meet all operating conditions in capacities up to 100 gallons per minute as required for any type of fuel oil burner.

Shipment is made complete, ready for placing on foundation and connection to station piping within short period of time.

Write for Bulletin OB40 giving details.

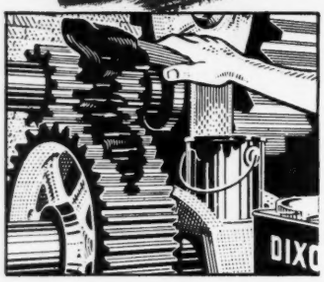
THE ENGINEER COMPANY

75 WEST STREET Enco Streamline Baffles NEW YORK, N. Y.

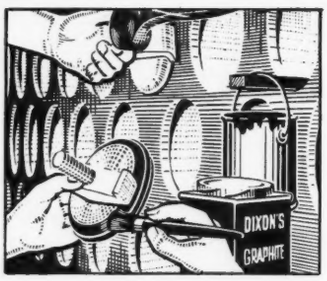
SIX "HOWS" FOR USING AND SAVING WITH DIXON'S GRAPHITE

Use Graphite, either alone or in oil, wherever lubricant must withstand high pressures, temperatures, speeds, grit-laden air, moisture, solvents. Use it also to coat screw and flange joints, gaskets and packing. Be sure to use recommended grades to insure best results. Be safe, use DIXON'S Graphite Products, yardsticks of service since 1827.

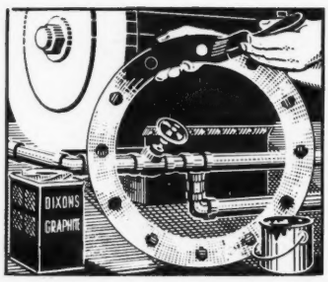
For many other ways of using and saving with Graphite, write for printed matter 94.



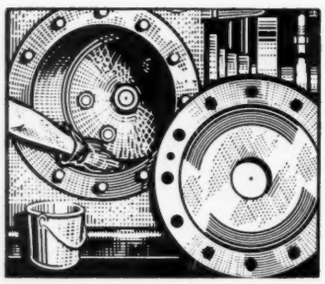
Apply DIXON'S Ticonderoga Flake Lubricating Graphite No. 1 (large, lustrous flakes) mixed with gear grease to gears. No. 2 (finely divided flakes) and No. 635 (minutely subdivided flakes) also are used for similar applications. DIXON'S Graphited Ready-to-Use Gear Grease is preferred by many.



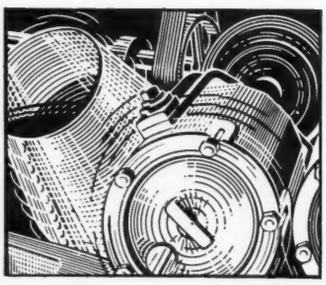
Brush DIXON'S Ticonderoga Flake Lubricating Graphite No. 2 in oil on boiler plug gaskets and bolt threads to speed "setting up" and "ease" their future disassembly. No. 635 also is often used for such jobs.



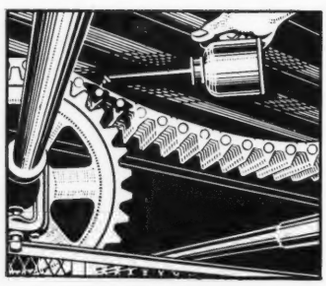
Brush a mixture of DIXON'S No. 2 Ticonderoga Flake Lubricating Graphite in oil on gaskets. DIXON'S No. 1 is preferred by many. DIXON'S Ready-to-Use Graphite Pipe Joint Compound and Graphite Seal, are the choice of many.



Swab cylinder walls of steam engines, pumps, etc., with mixture of DIXON'S No. 635 Flake Lubricating Graphite in oil.



Tumble metal parts in DIXON'S Dry No. 635 Flake Lubricating Graphite to provide a sleek lubricating coating.



Lubricate power transmission chains with DIXON'S Ticonderoga Flake Lubricating Graphite No. 2 in oil. DIXON'S No. 635 is also used for this purpose.

3235

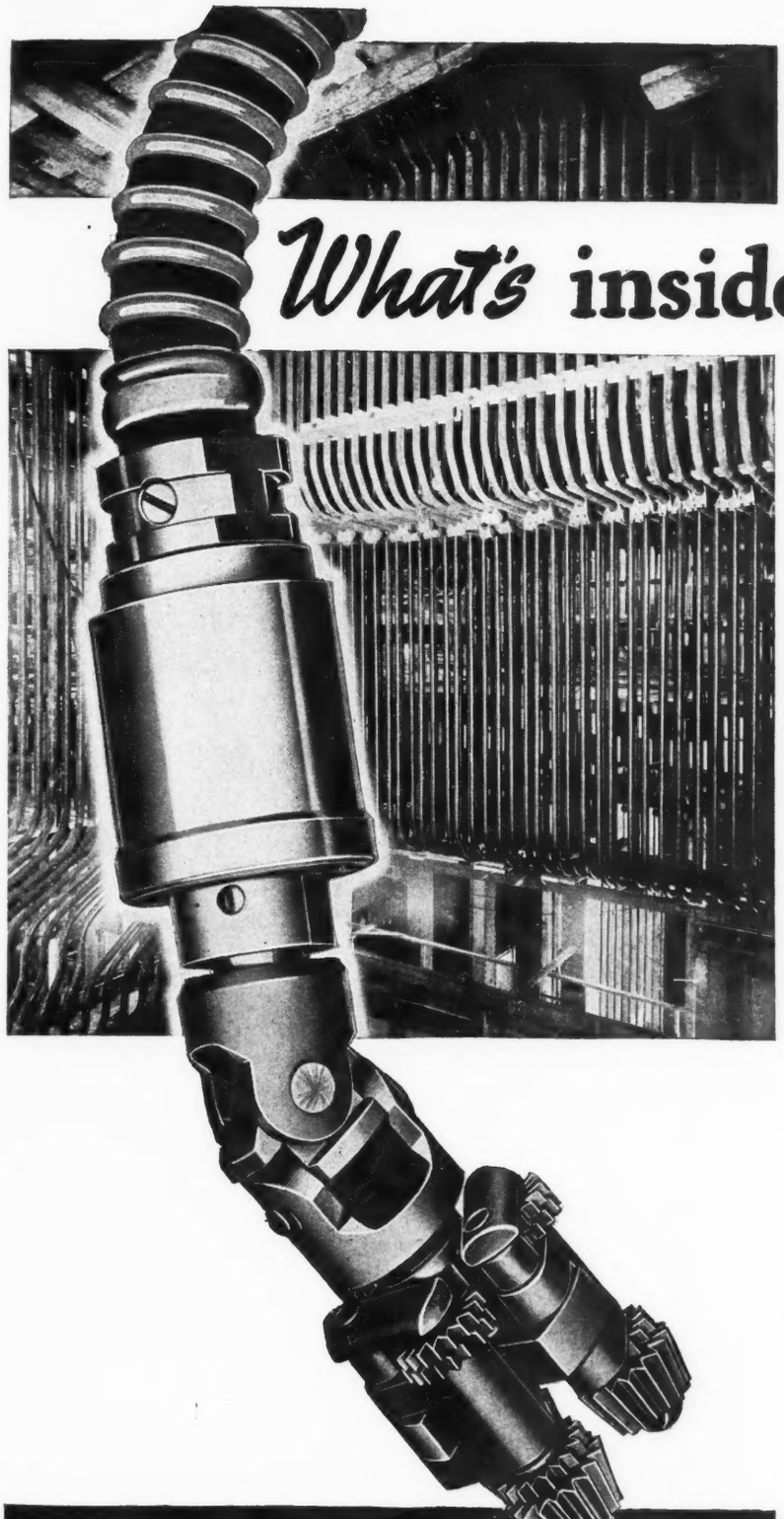
EXCELLENCE D SINCE 1827

Equipment these days is precious

and interruptions are disastrous—"draft" a DIXON graphite lubricant—there is one for every use—Write for Printed Matter No. 94.

JOSEPH DIXON CRUCIBLE CO., JERSEY CITY, N. J.

Ticonderoga Graphite • No. 635 Graphite • Microfyne Graphite
Pipe Joint Compound • Graphite Seal • Graphited Oils • Cup and
Pressure Gun Grease • Gear Lubricants • Waterproof Graphited Grease
Auto-Marine Grease • Graph-Air Guns • Belt Dressing (Contains no Graphite).



What's inside *of the tubes?*

Scale-crusted tube walls don't show—except on the steam gage and the fuel bill. But they show up plenty there. And when they do, a bit of Elliott-Lagonda boiler tube treatment is indicated.

This treatment requires only the inserting of the correct Elliott-Lagonda tube cleaner, turning on the air, steam, or water, and letting the cleaner restore the bloom of youth to inside tube surfaces.

Elliott-Lagonda cleaners are as modern as the design of the boilers or other apparatus whose tubes they clean. All the way from cleaners for straight tubes, to cleaners that can squirm and twist their way through all kinds of tube bends, chewing out the scale like a rat through cheese. All sizes, too.

When you have a tube cleaning job that is making trouble, ask the Elliott-Lagonda people.

ELLIOTT LAGONDA

Cleaners for all tubes

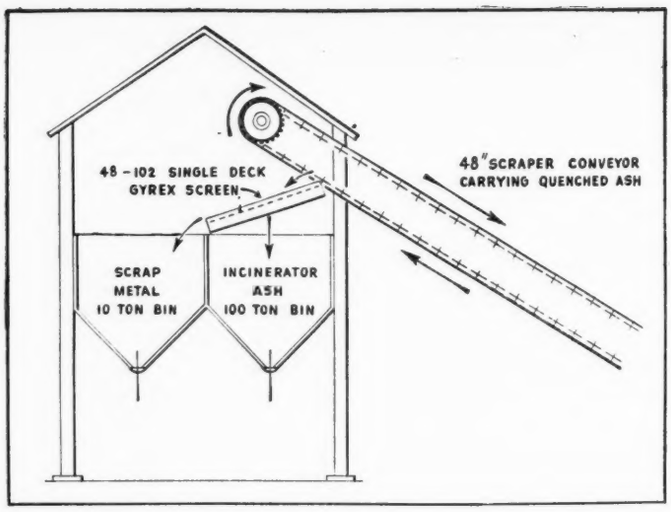
ELLIOTT COMPANY

LAGONDA-LIBERTY Tube Cleaner Dept.

SPRINGFIELD, OHIO

DISTRICT OFFICES IN PRINCIPAL CITIES

Y-185



Pittsburgh Salvages 10,000 tons of Scrap —and nets $60,000

Robins engineers and machinery often participate in interesting installations. Many of them are unusual, some actually unique. One in the latter classification came up recently in Pittsburgh. Mr. D. C. Agar, Managing Engineer of the Bureau of City Refuse, wanted to salvage the scrap in city residue agglomerate. The screening methods used in coke plants seemed a logical and economical method of separation.

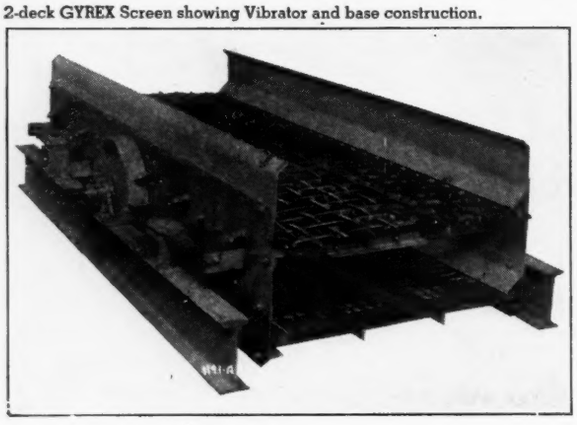
■ A suspended-type Robins GYREX Vibrating Screen was installed where it would receive material from the final scraper conveyor . . . at a total cost considerably less than $5,000.

■ At the present rate of recovery (and current contract selling-price) the City of Pittsburgh is recovering 10,000 tons of scrap for the war effort . . . and will net $60,000 a year from the salvaged metal.

■ Robins engineers are at your disposal for advice regarding economical efficient applications of screens and materials handling machinery.

ROBINS
CONVEYING BELT COMPANY
PASSAIC • N. J.

2-deck GYREX Screen showing Vibrator and base construction.



For Material Aid
in
Materials Handling
It's ROBINS

Where Wiring Needs
REAL PROTECTION
THE ANSWER IS STILL
Buckeye Conduit
THE YOUNGSTOWN SHEET & TUBE CO.
YOUNGSTOWN
ENAMELED
MADE IN YOUNGSTOWN, OHIO U.S.A.
RIGID STEEL CONDUIT
BUCKEYE
TRADE MARK
YOUNGSTOWN
CONDUIT
THE YOUNGSTOWN SHEET AND TUBE COMPANY
YOUNGSTOWN, OHIO
Ask your distributor for Youngstown Conduit • Pipe and Tubular Products • Sheets • Plates • Tinplate • Bars • Rods • Wire • Nails • Tie Plates and Spikes.

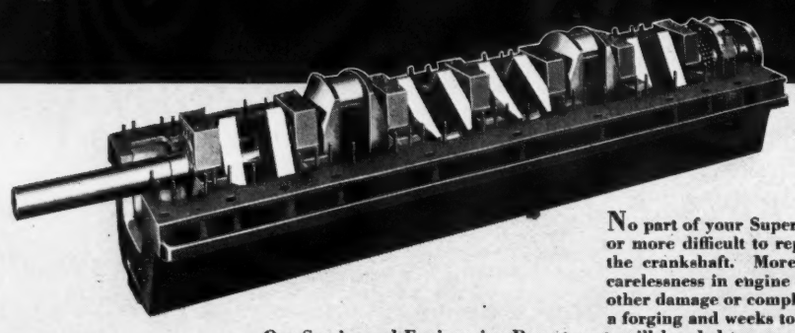
WAR denies the use of rigid steel conduit for all except most vital needs. If your need qualifies you for it, you will find war-time Buckeye Conduit the same dependable product—insuring permanent protection to vital electrical wiring.

But if war bids you say goodbye to Buckeye for the duration, remember this:

After Victory is won and there is steel to spare, the same dependable Buckeye Conduit will be available.

26-22E

THE BACKBONE OF YOUR *Superior Diesel*



No part of your Superior Diesel is likely to be more costly or more difficult to replace under existing conditions than the crankshaft. Moreover, a crankshaft broken through carelessness in engine care and operation, may cause much other damage or complete wreckage. It takes months to get a forging and weeks to machine it for a large engine.

Our Service and Engineering Departments will be glad to consult with you on any special problems not clearly covered in the regular Operating Manuals furnished with our engines.

Our factory trained Service Engineers are now engaged in the production of engines for our Armed Forces, and altho available for Field Service assignments, their time can often be conserved by preventative care on the part of the engine operating personnel.

FOLLOW THESE INSTRUCTIONS FOR PREVENTATIVE CARE

LUBRICATION

1. Use oils that we or reputable refiners recommend.
2. Use lube oil filters as specified by us. Severe conditions may justify installation of special lube oil purifiers.
3. Keep filters clean and replace elements frequently.
4. Maintain proper lube oil temperatures and pressures.

BEARING CLEARANCES

Check main and crankpin bearings for excessive clearances at least once or twice annually, and replace bearing shells or make adjustments as may be necessary without delay. Time and cost to make this inspection is small as compared to that for replacement of a crankshaft.

CRANKSHAFT ALIGNMENT

When checking bearing clearances, also check crankshaft alignment as described in your Superior Operating Manual.

DRIVEN MACHINERY

Your installation was designed to be free from harmful critical vibrations in the working range. Do not materially change bearings, clutches, shafting, or heavy revolving masses such as pulleys, generator rotors, etc., without consulting us.

GENERAL OPERATION

Always avoid overloads, shock loads, and any unwarranted abuse of engine. Keep engine securely bolted down to rigid and level foundation at all times.

NSCO
REG. U. S. PAT. OFF.

SUPERIOR ENGINE DIVISION... THE NATIONAL SUPPLY COMPANY

SALES OFFICES: Springfield, Ohio; Philadelphia, Penna.; New York, N. Y.; Los Angeles, Calif.; Jacksonville, Fla.; Houston, Texas; Chicago, Ill.; Fort Worth, Texas; Tulsa, Okla.; Boston, Mass. FACTORY: Springfield, Ohio

INVESTIGATE
this aid to greater plant safety

The Kennedy-Erwood Safety Swing Gate Valve protects low pressure apparatus from excessive pressures. Its ingenious safety feature is the spring-controlled disc, which enables the valve to be closed as a standard gate valve, but which opens automatically at a predetermined back pressure to relieve excessive unbalanced pressure. This design therefore combines the functions of a gate valve, check valve and relief valve in a single unit. It has proven its benefits in service as a non-return valve, back-pressure valve, atmospheric relief valve, and safety gate valve, wherever low-pressure apparatus should be protected against building up of excessive pressures.

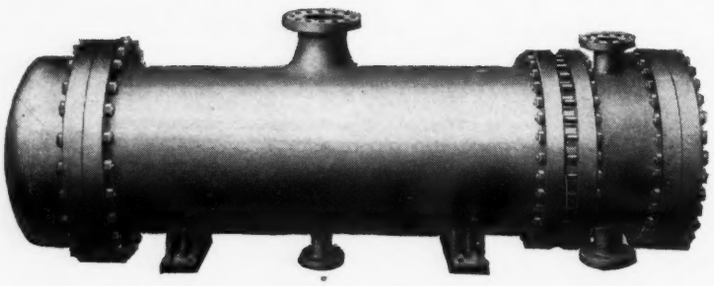
The design and features of the Kennedy-Erwood Valve are fully explained in the new 240-page Kennedy catalog, which also includes bronze and iron-body gate, globe, angle and check valves for a wide range of pressures, bronze and malleable iron screwed pipe fittings, and cast iron flanged fittings. Every valve user should have a copy of this helpful catalog. Your copy sent free on request.

THE KENNEDY VALVE MFG. CO. **ELMIRA, N. Y.**

KENNEDY-ERWOOD
***Safety* SWING GATE VALVES**

FEED WATER HEATER EQUIPMENT

for High, Intermediate, or Low Pressure Service



Lummus-designed and Lummus-built boiler feed water heaters are operating at pressures as high as 1200 pounds per square inch. Numerous Lummus units are in service in the intermediate and low pressure fields.

Lummus heat exchangers are available in all pressure ranges employed in modern power plants. Lummus heat exchanger equipment also includes Surface Condensers, Steam Jet Air Pumps, Fuel Oil Heaters, Lubrication Oil Coolers.

Lummus engineering personnel and construction facilities are available to public utilities and industrial power plants requiring equipment to meet specific conditions. Write for further information.

THE LUMMUS COMPANY
420 Lexington Ave., NewYork, N.Y.

LUMMUS

STREAMLINE YOUR STEAM LINES..WITH *ALL-WELDED* INSULATED PIPE UNITS

Welding Connections between flanged units

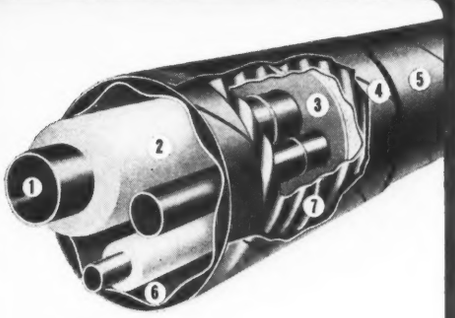
. . For Faster Steam Supply!

SPEED on installation of steam lines is of utmost importance in wartime construction. Ric-wiL does most of the work in the factory—so *you* don't have to do it on the job. That saves precious time! And a Ric-wiL job is complete—you don't wait for missing parts or for a great variety of labor in the field!

For a steam-and-watertight connection on both pipe and conduit, use Ric-wiL Insulated Pipe Units with *all-welded* connections, as pictured above. They give a perfect, permanent seal and a joint of maximum strength.

These are totally pre-fabricated, ready-to-install units, ideal for both speed and economy. Structural strength of Hel-Cor spiral conduit exceeds *any normal* service requirements. Units are furnished in 20-foot lengths, for single and multiple pipes, for any kind of steam pipe or insulation desired, for underground or overhead. Can be quickly installed, with minimum trenching, in ANY kind of weather. All expansion loops, conduit fittings, anchors, watertight glands for walls, and other parts can also be furnished ready to install.

Write for Catalog "S", showing *all* types of Ric-wiL Conduit construction.



1—Steam pipe
2—Sectional pipe covering
3—Pipe support
4—Thick strip asphalt applied after welding
5—Asbestos felt over asphalt coated Hel-Cor
6—Air space
7—Butt welded connection

Engineers on War Projects ONLY: Ask on your letterhead for Engineering Manual 420-A.

RIC-WIL CONDUIT SYSTEMS FOR UNDERGROUND STEAM
THE RIC-WIL COMPANY · CLEVELAND, OHIO
AGENTS IN PRINCIPAL CITIES

Pioneered WING Products

WING pioneered and developed the ceiling-suspended, light-weight unit heater, projecting the heated air vertically downward, over 22 years ago. Every improvement since then in this type of industrial plant heating, including the new Revolving Heaters, has been inaugurated by WING engineers.

WING Revolving UNIT HEATERS

Because they revolve, Wing heaters gently circulate warm air around bulky machines and other obstacles and into otherwise cold corners, assuring a comfortable temperature at every part of the working level.

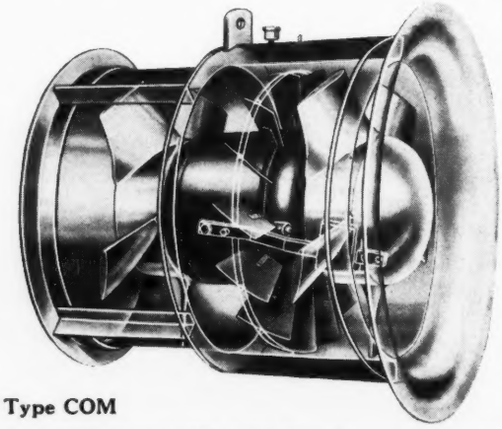
Many plant engineers, who have used this exclusive new type of heat circulation for years, attribute their satisfaction with Wing Revolving Unit Heaters to the fact that the moving streams of heated air sweep slowly around a complete circle reaching walls and corners and over obstructions; thus, no worker or group of workers can be subjected to energy consuming blasts of hot air, as from fixed discharge heaters. The result of all this is higher heating efficiency and greater worker comfort. Wing Bulletin No. HR-2 gives the detailed reasons.

WING pioneered and developed the individual forced draft blower for boiler plants nearly 40 years ago. In this field, WING engineers were constantly ahead of the rest of the industry, as in their pioneer work in the development of the Axial Flow Blower over 5 years ago.

WING AXIAL FLOW BLOWERS

Type EMV
Type EMB

WING Axial Flow Blowers are being used on battleships, cruisers, destroyers, aircraft carriers, mine layers and sweepers, seaplane tenders and many other types of vessels. Types EMV and EMD are single stage blowers for static pressures up to 3" at moderate speeds. Type EMD is a remarkably compact blower and is furnished with adjustable damper blades.



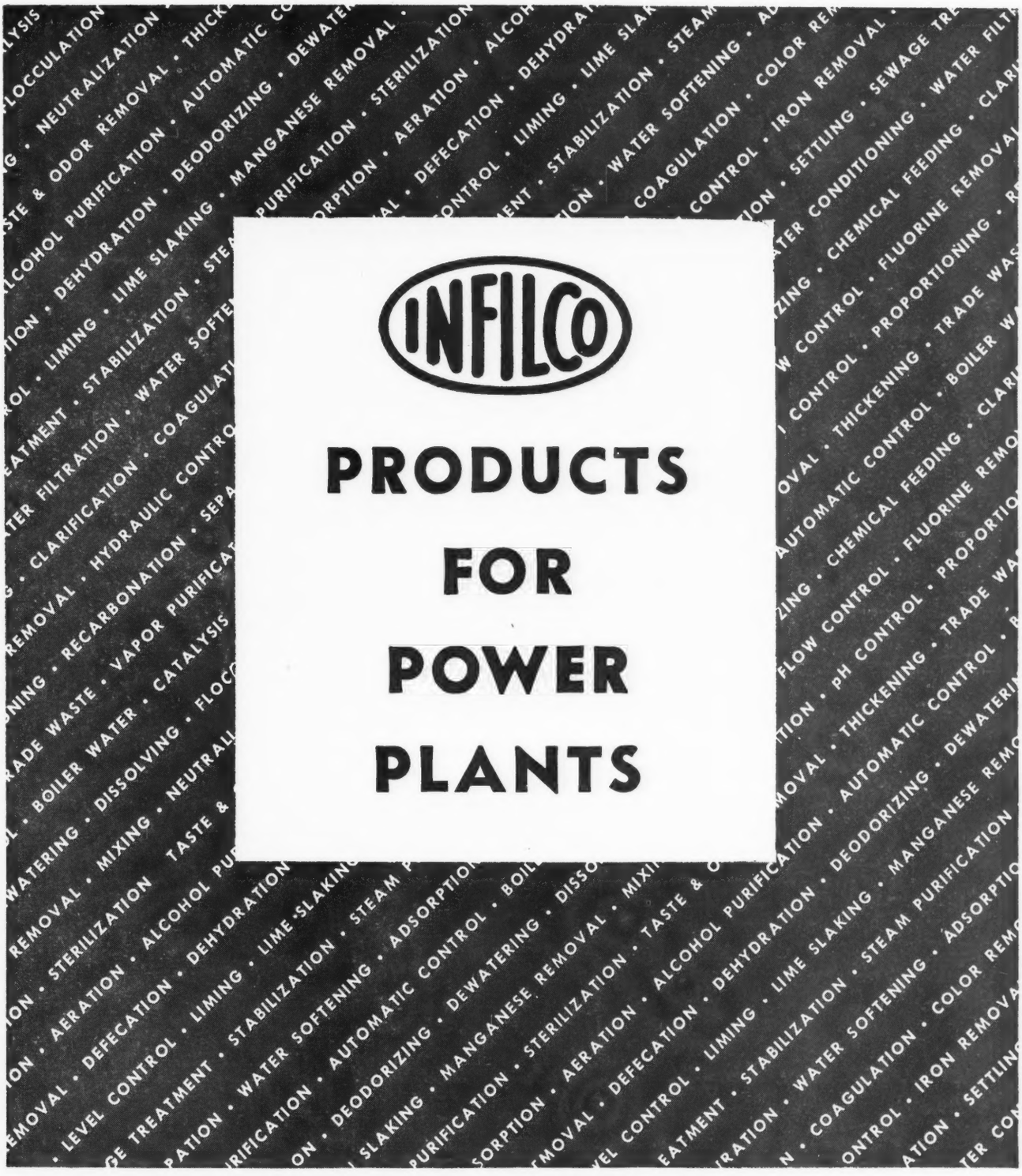
Type COM

The WING Type COM Axial Flow Blower is a two-stage blower for static pressures up to 7". These pressures are obtained even at the moderate speeds of standard commercial motors. Type COM Blowers are equipped with adjustable built-in control vanes and may be controlled manually or automatically. Five years of highly satisfactory service in marine and industrial applications are the best answer to the value of WING Axial Flow Fans in forced draft or ventilating work.

L. J. WING MFG. CO., WEST 14th STREET & 7th AVENUE, NEW YORK, N. Y.

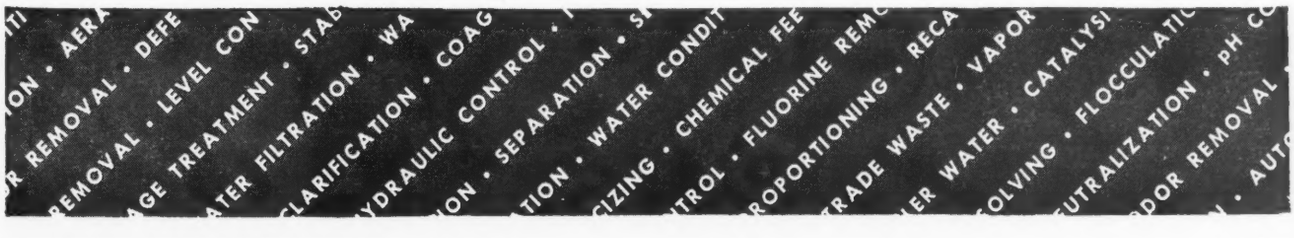
TURBINE BLOWERS	FOG ELIMINATORS	PROCESS HEATERS	MOTOR DRIVEN BLOWERS	VENTILATING FANS	REVOLVING UNIT HEATERS	EXHAUSTERS	FLOODLIGHT HEATERS	STEAM TURBINES	SHIP VENTILATORS

WING TURBINE BLOWERS • FOG ELIMINATORS • PROCESS HEATERS • MOTOR DRIVEN BLOWERS • VENTILATING FANS • REVOLVING UNIT HEATERS • STEAM TURBINES • SHIP VENTILATORS • FIXED DISCHARGE HEATERS • EXHAUSTERS



INFILCO
INCORPORATED

325 WEST 25TH PLACE, CHICAGO, ILLINOIS



This advertisement is offered to Industries engaged in the Nation's War Program as a contribution by Cardox Corporation

Since fire protection is the business of Cardox, this organization frequently sees the disastrous results of fire . . . the apallingly needless waste, the breakdown of production schedules. These things follow often when adequate thought is not given to the planned elimination of fire hazards.

For this reason war industries are offered the experienced counsel of Cardox, as part of its obligation to see that fire does not unnecessarily delay—by one day or one hour—the continuous flow of war materials on which this Nation's Victory depends.

Approach FIRE Realistically

Fire was once thought of as a haphazard calamity that struck without warning or reason. It was put in the unpredictable class—the same as lightning. As you know, that approach to the problem of fire is outmoded. Even lightning itself can be planned for.

The way to prevent fire damage is to anticipate it. Thousands of small fires never become catastrophies, thanks to the dependable operation of today's adequate fire extinguishing systems—soundly planned and soundly *engineered.*

Reminder to Power Men

So, to executives who may soon become too busy to give extensive consideration to their own fire hazards, this reminder is extended:

Fire in a power plant *may* destroy costly equipment that cannot be spared. It *can* do far more than that. *It can stop production in every industry and on every operation that depends on that power plant's output.* Who can measure the cost of such a power failure? What price for planes, guns, shells or ships that got there too late?

As a contribution to the war effort Cardox offers this friendly suggestion to executive engineers: Keep your fire protection up to the new high speed of industry. Make your hazard surveys more thorough and more frequent. Keep posted on progress in protection developed by wartime fire problems.

Write, on your letterhead, for Bulletin 9122.

How Cardox Systems Protect War Industries

- *Timed discharges, as needed, through built-in piping systems . . . supplied instantly from a single storage unit holding tons (if required) of liquid Cardox CO_2.*
- *Mass discharge of Cardox CO_2 "knocks out" fire, by . . .*
- *Reducing oxygen content of the atmosphere below the concentration necessary for combustion, and . . .*
- *Cooling combustibles and fire zone below ignition temperature . . .*
- *Extinguishing fire quickly and completely* without *damage from extinguishing medium.*

CARDOX—CO_2 Systems with Enhanced Fire Extinguishing Performance

A. *Uniformity of CO_2 characteristics.*
B. *Extinguishing medium with uniformly greater cooling effect.*
C. *Accurate projection of CO_2 through greater distances.*
D. *Timed discharges, as needed, through built-in piping systems . . . supplied quickly from a single tank holding tons of liquid Cardox CO_2.*

CARDOX CORPORATION • BELL BUILDING, CHICAGO, ILL.
District Offices in New York • Washington • Detroit • Pittsburgh • Cleveland
Atlanta • San Francisco • Los Angeles • Seattle

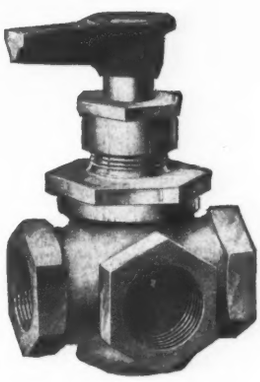
CARDOX
NON-DAMAGING FIRE EXTINGUISHING SYSTEMS

GET Longer Service... Lower Upkeep

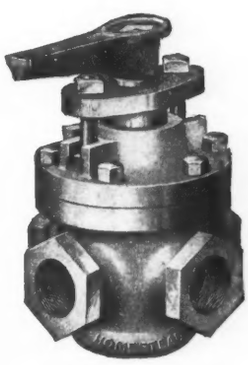
with

HOMESTEAD QUARTER-TURN VALVES

Straight-way



3-way



4-way

Here's why you get longer valve service and lower upkeep from Homestead Quarter-Turn Valves.

- Seating surfaces protected in both open and closed positions. Cannot be cut or scored by fluid or grit. Long, leakless service.
- Cam-seated plug assures positive fluid control.
- Sealed bottom, bonnet and stem prevent wasteful leakage to outside.
- Full opening or closing by a quarter turn saves time and wear.
- Requires no lubrication . . . no up-keep.

Homestead Quarter-Turn Valves are made in sizes, types and metals for the majority of your valve needs; for all fluids, pressures to 3000 pounds, and temperatures to 750° F.

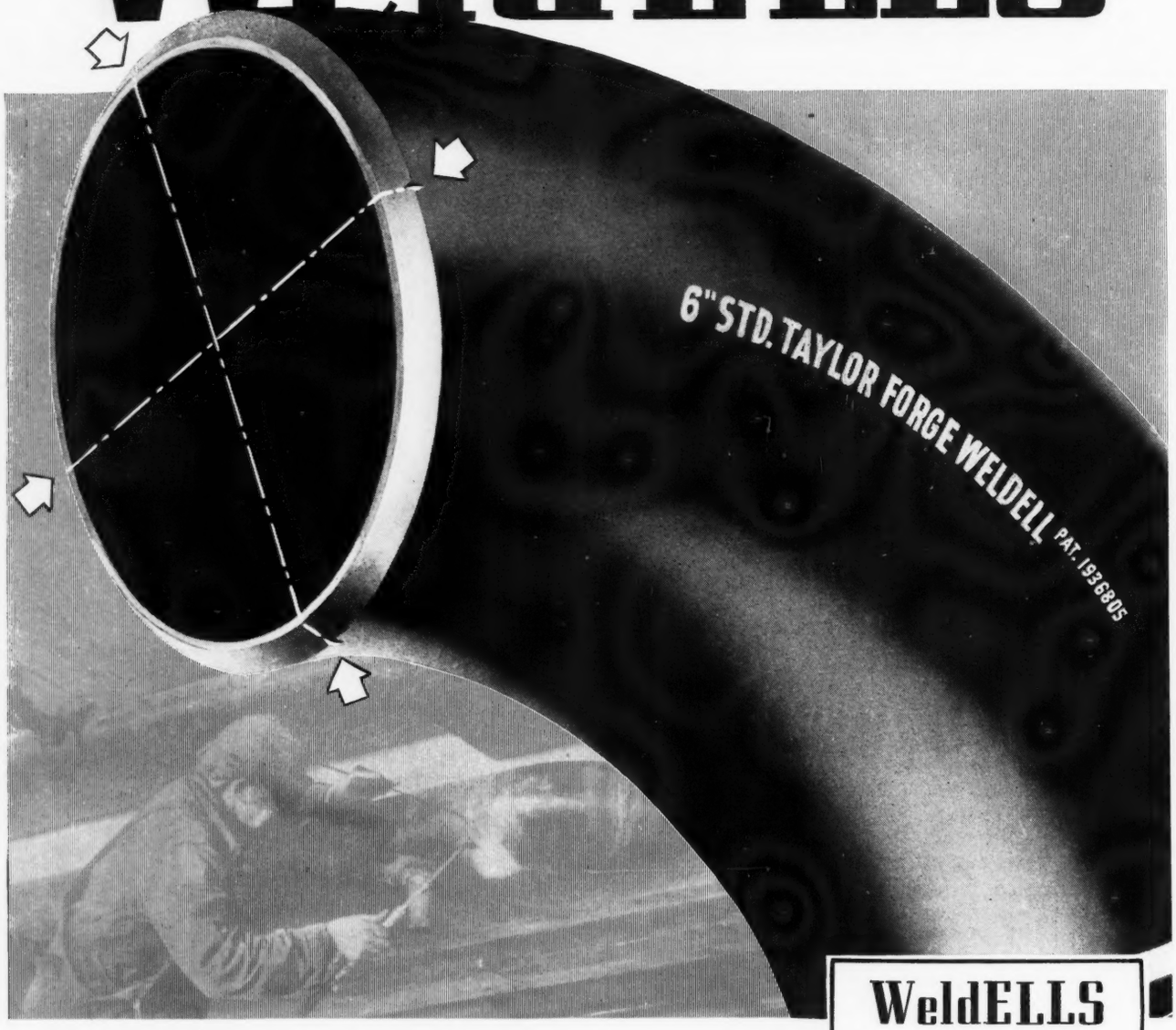
Choose the type for your service from Reference Book No. 38 which gives complete information about these and other Homestead Valves. Write for your copy now.

HOMESTEAD VALVE MFG. CO.

MAKERS OF "PEAK PERFORMANCE" VALVES FOR 50 Years 1892 1942

P. O. BOX 210 • • • CORAOPOLIS • • • PENNSYLVANIA

WeldELLS



THEY SPEAK HIS LANGUAGE

—*these precision quarter-marks*

Just ask the man who welds them, if you question the importance of these precision quarter-marks that are found only on WeldELLS and other Taylor Forge Welding Fittings.

He'll tell you how much time and trouble these reference points save in figuring center lines, angles and offsets; how much easier they make it to keep piping lined up in the proper plane. Fact is, this exclusive feature would be reason enough to insist on WeldELLS even if they didn't have the many other improving features listed opposite.

But quarter-marks are only one extra value of the fittings that have *everything* . . . for the man who specifies, welds, or pays the bill!

WeldELLS
have *everything*—

No other fittings for pipe welding combine these features which in addition to quarter-markings include:

▶ **Seamless**—Greater strength and uniformity.

▶ **Tangents**—Keep weld away from zone of highest stress—simplify lining up.

▶ **Selective reinforcement**—provides uniform strength.

▶ **Permanent and complete identification marking** — saves time and eliminates errors in shop and field.

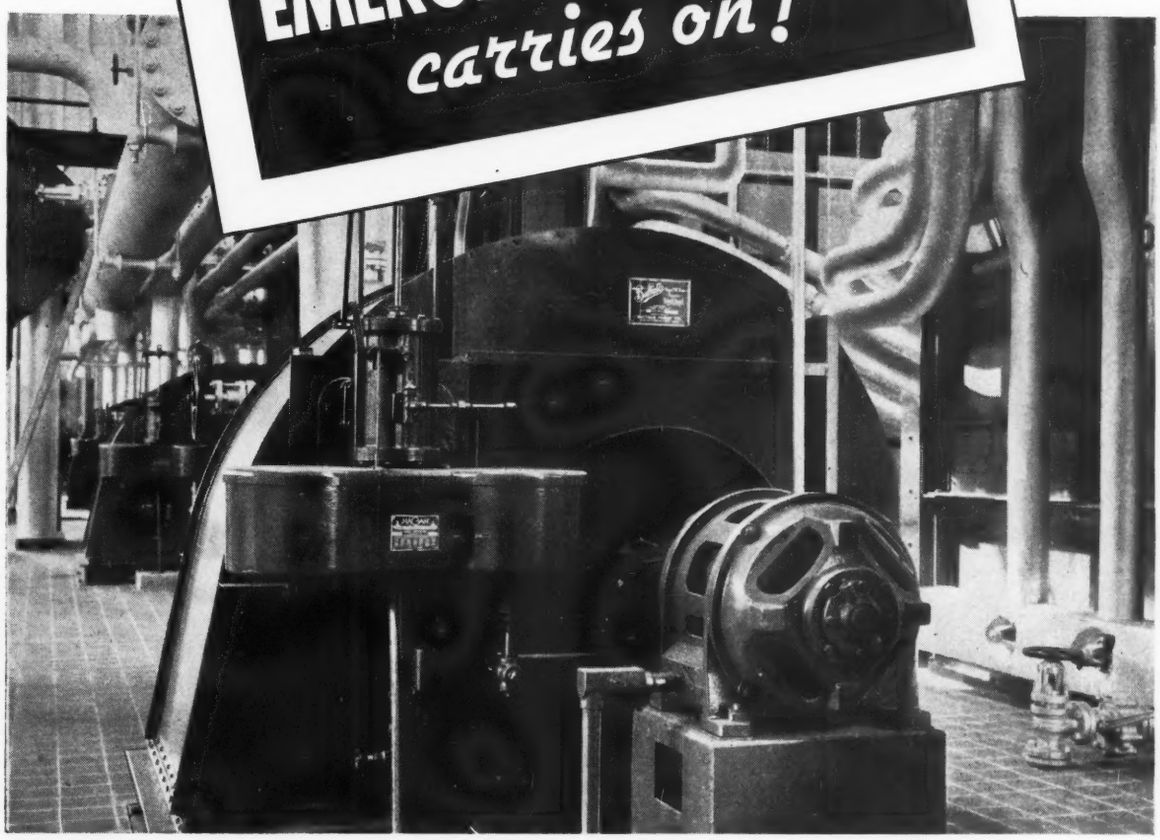
▶ **Wall thickness never less than specification minimum**—assures full strength and long life.

▶ **Machine tool beveled ends**—provide best welding surface and accurate bevel and land.

▶ **The most complete line of Welding Fittings and Forged Steel Flanges in the World**—insures complete service and undivided responsibility.

TAYLOR FORGE & PIPE WORKS, General Offices & Works: Chicago, P. O. Box 485
New York Office: 50 Church Street • Philadelphia Office: Broad Street Station Bldg.

Their in-built "EMERGENCY MARGIN" *carries on!*



Buffalo Forced Draft Fans have long served industry's power needs dependably and at low power cost. Today, these husky fans are getting a chance to prove *conclusively* their mettle—*and they are doing it!* In power plants throughout the nation, Buffalo Fans are helping hold boiler pressures at peak levels—helping keep generators humming at full capacity—helping Industry meet its responsibility to our armed forces.

ARMY E NAVY

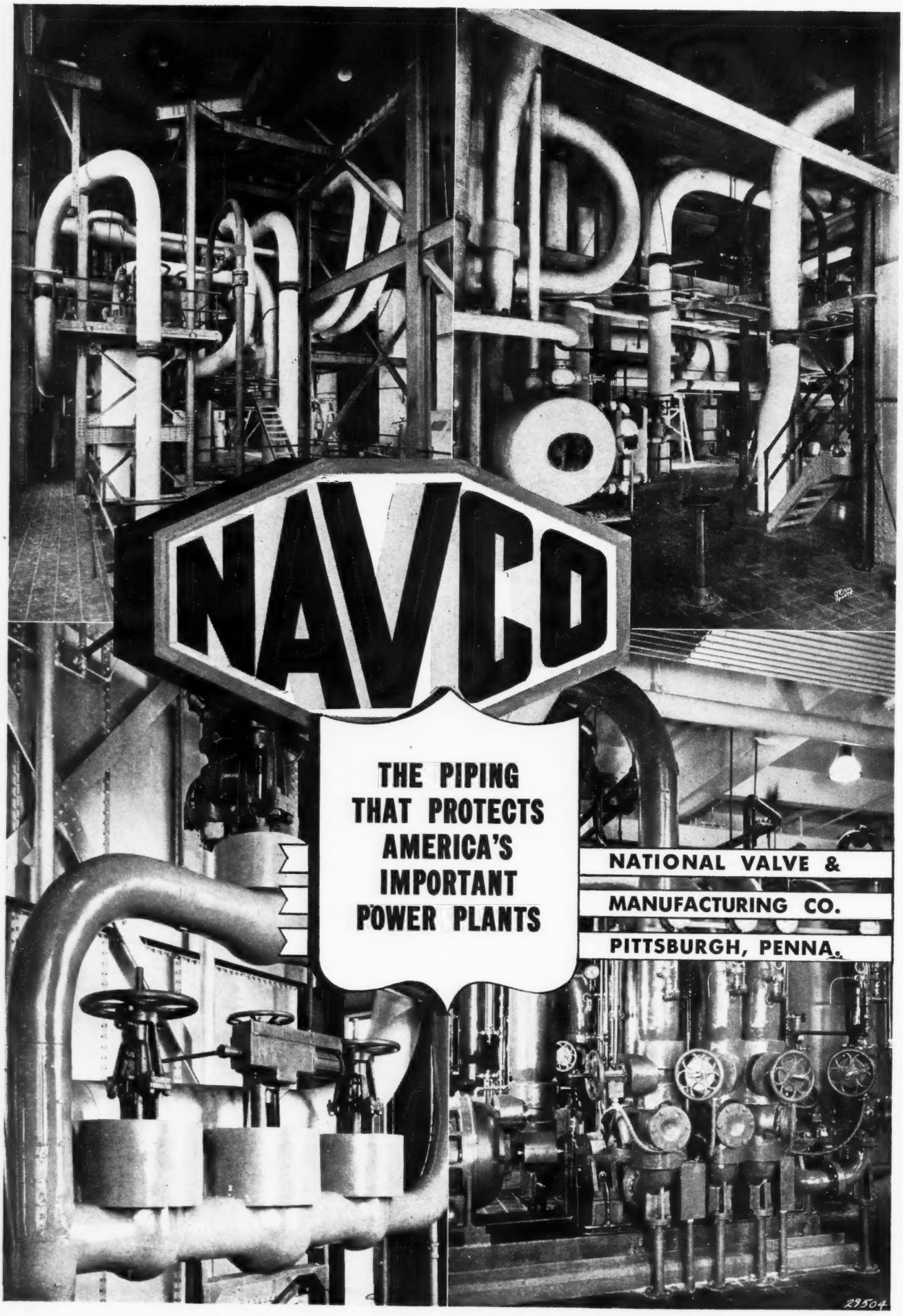
BUFFALO FORGE COMPANY

488 BROADWAY **BUFFALO, N. Y.**

Branch Engineering Offices in Principal Cities

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

"Buffalo" FORCED DRAFT FANS


NAVCO
THE PIPING
THAT PROTECTS
AMERICA'S
IMPORTANT
POWER PLANTS
NATIONAL VALVE &
MANUFACTURING CO.
PITTSBURGH, PENNA.
29504

1943

POWER

DIRECTORY OF MANUFACTURERS

A Buyers' Guide of over 400 power products, and who makes each

★

How to use this directory — Look for the noun in the product name, for example: "Strainers, oil", not "Oil strainers"; "Accumulators, steam", not "Steam accumulators". Cross-indices help locate the item you are looking for.

Company names — Classified alphabetically under the product headings; those advertising in this issue of POWER are in bold-face type and under each of these listings appear page numbers of advertisements giving additional product information.

ABSORPTION SYSTEMS, REFRIGERATION

Vogt, Henry, Machine Co, 1000 West Ormsby St, Louisville, Ky.
Adv page 46
York Ice Machy Corp, York, Pa.

AC GENERATORS

(See Generators)

AC MOTORS

(See Motors)

ACCUMULATORS, REFRIGERATION

California Steel Products Co, Barrett & A Sts, Richmond, Calif.
Frigidaire Commercial & Air Cond Div, General Motors Sales Corp, Dayton, Ohio
McQuay, Inc, Minneapolis, Minn.
Marlo Coil Co, St. Louis, Mo.
Richmond Engrg Co, 7th and Hospital Sts, Richmond, Va.
Vilter Mfg Co, 2217 S First St, Milwaukee, Wis.

ACCUMULATORS, STEAM

Bartlett Hayward Div, 212 Scott St, Baltimore, Md.
Foster Wheeler Corp, 165 Broadway, New York, N. Y.
Adv pages 38, 39
Hodge Boiler Works, Boston, Mass.
Kieley & Mueller Inc, 2015-2033 43rd St, N Bergen, N. J.
Koppers Co, Pittsburgh, Pa.
Republic Flow Meters Co, 2222 Diversey Pkway, Chicago, Ill.
Adv pages 215, 221, 241, 280

ADSORBERS, ODOR

Dorex Div, W B Connor Engrg Corp, 114 E 32nd St, New York, N. Y.
Kaufman, H J, 13215 Roselawn Ave, Detroit, Mich.
Pease, Anthony Equip Corp, 30 Charles River Rd, Cambridge, Mass.

AFTERCOOLERS

(See Heat Exchangers)

AIR COMPRESSORS

(See Compressors)

AIR-COMPRESSOR GOVERNORS

(See Governors, Air-Compressor)

AIR CONDITIONERS, CENTRAL STATION

Air & Refrigeration Corp, 475 Fifth Ave, New York, N. Y.
Airtemp Div, Chrysler Corp, Dayton, Ohio
American Blower Corp, 6000 Russell St, Detroit, Mich.
Bahnson Co, Winston-Salem, N. C.
Bryant Heater Co, 17825 St Clair Ave, Cleveland, Ohio
Carrier Corp, Syracuse, N. Y.
Clarage Fan Co, 619 Porter St, Kalamazoo, Mich.
Adv page 147
Curtis Refrigerating Machine Co, St Louis, Mo.
Fairbanks, Morse & Co, 600 S Michigan Ave, Chicago, Ill.
Frigidaire Commercial & Air Cond Div, General Motors Sales Corp, Dayton, Ohio
General Electric Co, Schenectady, N. Y.
Adv pages 32, 33
General Refrigeration Div, Yates-American Machine Co., Beloit, Wis.
Hastings Air Conditioning Co, Hastings, Neb.
Kennard, Sam, Inc, 3333 Market St, St Louis, Mo.
McQuay, Inc, Minneapolis, Minn.
Marlo Coil Co, St Louis, Mo.
Michell Air Conditioning Co, Schenectady, N. Y.
Modine Mfg Co, Racine, Wis.
Niagara Blower Co, 6 E 45th St, New York, N. Y.
Palmers Mfg Corp, Phoenix, Ariz.
Parks-Cramer Co, Fitchburg, Mass.
Refrigeration Economics Co, Canton, Ohio
Richmond Engrg Co, 7th and Hospital Sts, Richmond, Va.
Ross, J O, Engrg Corp, New York, N. Y.
Sturtevant, B F, Co, 47 Readville St, Boston, Mass.
Adv pages 40, 41
Trane Co, La Crosse, Wis.
Typhoon Air Conditioning Co, 252 W 26th, New York, N. Y.
Vilter Mfg Co, 2217 S First St, Milwaukee, Wis.
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61
York Ice Machy Corp, York, Pa.

AIR CONDITIONERS, UNIT, INTEGRAL COMPRESSOR

Airtemp Div, Chrysler Corp, Dayton, Ohio
Carrier Corp, Syracuse, N. Y.

Look for the noun in the product listing, for example:

"Arches, Boiler"

not

"Boiler Arches"

Curtis Refrigerating Machine Co, St Louis, Mo.
Fairbanks, Morse & Co, 600 S Michigan Ave, Chicago, Ill.
Frigidaire Commercial & Air Cond Div, General Motors Sales Corp, Dayton, Ohio
General Electric Co, Schenectady, N. Y.
Adv pages 32, 33
General Refrigeration Div, Yates-American Machine Co, Beloit, Wis.
Ice Cooling Appliance Corp, Morrison, Ill. *(Ice-cooled units)*
Philco Corp, Philadelphia, Pa.
Trane Co, 2012 Cameron Ave, La Crosse, Wis.
Typhoon Air Conditioning Co, 252 W 26th St, New York, N. Y.
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61
York Ice Machy Corp, York, Pa.

AIR CONDITIONERS, UNIT, REMOTE COMPRESSOR

Air & Refrigeration Corp, 475 Fifth Ave, New York, N. Y.
Carrier Corp, Syracuse, N. Y.
Clarage Fan Co, 619 Porter St, Kalamazoo, Mich.
Adv page 147
Curtis Refrigerating Machine Co, St Louis, Mo.
Fedders Mfg Co, 63 Tonawanda St, Buffalo, N. Y.
Frigidaire Commercial & Air Cond Div, General Motors Sales Corp, Dayton, Ohio
General Electric Co, Schenectady, N. Y.
Adv pages 32, 33
General Refrigeration Div, Yates-American Machine Co, Beloit, Wis.
Kennard, Sam, Inc, 3333 Market St, St Louis, Mo.
McQuay, Inc, Minneapolis, Minn.
Niagara Blower Co, 6 E 45th St, New York, N. Y.
Refrigeration Economics Co, Canton, Ohio
Trane Co, 2012 Cameron Ave, La Crosse, Wis.
Typhoon Air Conditioning Co, 252 W 26th St, New York, N. Y.
Vilter Mfg Co, 2217 S First St, Milwaukee, Wis.
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61
York Ice Machinery Corp, York, Pa.

AIR HEATERS

(See Preheaters, Air)

AIR RECEIVERS

(See Receivers, Air)

ALARM SYSTEMS, FIRE

(See Sprinkler Systems, Fire)

CUTS CORNERS-COSTS
. . . IN MAINTENANCE TESTING

With Clamp-Ammeter testing so simple . . . requiring so little time . . . plants everywhere are adopting this modern test procedure. *There are no hook-ups necessary . . . no transformers or shunts required . . . no circuits to be disturbed.* Simply place the clamping jaws around the conductor or switch blade, and the meter indicates the current in the circuit. Tests on AC electrical circuits are made in a fraction of the time usually required. » » » Be sure you have all the facts on this modern, inexpensive maintenance tool. Write to Weston Electrical Instrument Corporation, 679 Frelinghuysen Avenue, Newark, New Jersey.

THE WESTON MULTI-RANGE AC CLAMP AMMETER

BEFORE YOU BUY ANY COMBUSTION TEST SET

Read This FREE BOOK!

Learn what is meant by combustion testing—the importance of CO_2, draft and flue gas temperature. Learn how to run an orsat, how to cure chimney troubles—how to check an installation. This book tells all and is sent without cost or obligation. Send name and address—

CLIP AD and MAIL to

THE HAYS CORPORATION
SINCE 1901 COMBUSTION INSTRUMENTS AND CONTROL
MICHIGAN CITY, INDIANA, U.S.A.

ALARM SYSTEMS, FLAME FAILURE

Bailey Meter Co, 1036 Ivanhoe Rd, Cleveland, Ohio
Adv pages 14, 15
Brown Instrument Co, 4490 Wayne Ave, Philadelphia, Pa.
Adv pages 51, 240, 254, 258, 266
Ess Instrument Co, Fort Lee, N. J.
General Controls Co, 810 Allen Ave, Glendale, Calif.
Photoswitch, Inc, 21 Chestnut St, Cambridge, Mass.
Stock Engrg Co, 9805 Theodore Ave, Cleveland, Ohio
Adv page 164
Wheelco Instruments Co, 1929 S Halstead Ave, Chicago, Ill.
Adv pages 203, 216, 254, 258

ALARMS, LOW-WATER

(See Water Columns)

ALLOYS, METALS FOR SPECIAL SERVICE

Allegheny Ludlum Steel Corp, Pittsburgh, Pa.
American Brass Co, Waterbury, Conn.
Adv page 121
American Manganese Steel Div, American Brake Shoe & Foundry Co, 397 E 14th St, Chicago, Ill.
Duriron Co, Inc, Dayton, Ohio
Electro Refractories & Alloys Corp, Andrews Bldg, Buffalo
Harris, Arthur, & Co, 212 N Aberdeen St, Chicago, Ill.
Haynes Stellite Co, Kokomo, Ind.
Hills-McCanna Co, 3025 N Western Ave, Chicago, Ill.
International Nickel Co, 67 Wall St, New York, N. Y.
Adv pages 34, 145
Lukens Steel Co, Coatesville, Pa.
Magnolia Metal Co, 120 Bayway, Elizabeth, N. J.
Mechanite Metal Corp, Dept A, 311 Ross St, Pittsburgh, Pa.
Mueller Brass Co, 1925A Lapeer Ave, Port Huron, Mich.
National Lead Co, 111 Broadway, New York, N. Y.
Phelps Dodge Copper Products Corp, 40 Wall St, New York
Plouff Co, 1151 Columbus Ave, Boston, Mass.
Revere Copper & Brass, Inc, 230 Park Ave, New York, N. Y.
Adv pages 20, 21
Ryerson, Jos T & Son, Inc, 16th & Rockwell Sts, Chicago, Ill.
Scovill Mfg Co, 99 Mill St, Waterbury, Conn.
Adv page 111
Timken Roller Bearing Co, Canton, Ohio
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61

ALUMINUM PAINT

(See Paint, Aluminum)

AMMETERS

Bristol Co, Waterbury, Conn.
Burlington Instrument Corp, 316 Valley St, Burlington, Iowa
Columbia Electric Mfg Co, 4519 Hamilton Ave, Cleveland, Ohio
Esterline-Angus Co, Box 596, Indianapolis, Ind.
Foxboro Co, 38 Neponset Ave, Foxboro, Mass.
General Electric Co, Schenectady, N. Y.
Adv pages 32, 33
Graybar Electric Co, 420 Lexington Ave, New York, N. Y.
Adv pages 214, 234, 243, 261, 265, 282, 284
Martindale Elec Co, 1385 Hird Ave, Cleveland, Ohio
Roller-Smith Co, 1766 W Market St, Bethlehem, Pa.
Adv page 206
Stewart-Warner Corp, 1826 W Diversey Pkwy, Chicago, Ill.
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61
Weston Electrical Instrument Corp, 614 Frelinghuysen Ave, Newark, N. J.
Adv pages 202, 267

AMMONIA GAS

(See Gas, Ammonia)

AMMONIA VALVES

(See Valves, Refrigeration)

ANALYZERS, CO_2, PORTABLE

Bacharach Industrial Inst Co, 7000 Bennett St, Pittsburgh,
Adv page 289
Burrell Technical Supply Co, 1936 Fifth Ave, Pittsburgh
Defender Automatic Regulator Co, St Louis, Mo.
Dwyer, F W, Mfg Co, 561 Washington St, Chicago, Ill.
Eimer & Amend, 635 Greenwich St, New York, N. Y.

Look for the noun in the product listing, for example:

"Arches, Boiler"

not

"Boiler Arches"

Engelhard, Charles, Inc, 234 N J R R Ave, Newark, N. J.
Friez, Julien P, Div, 4 N Central Ave, Baltimore, Md.
Hays Corp, 905 8th St, Michigan City, Ind.
Adv pages 202, 216, 227, 254
Hotstream Heater Co, Cleveland, Ohio
Permutit Co, Dept A, 330 West 42nd St, New York, N. Y.
Adv pages 152, 159

ANALYZERS, VIBRATION

Electrocon Co, 7 Varick St, New York, N. Y.
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61

ANEMOMETERS

Burrell Technical Supply Co, 1936 Fifth Ave, Pittsburgh, Pa.
Friez, Julien P, & Sons, 4 N Central Ave, Baltimore, Md.
Taylor Instrument Cos, Rochester, N. Y.

ARC-WELDING EQUIPMENT

(See Welding Equipment)

ARCHES, BOILER

Acme Brick Co, Fort Worth, Tex.
American Arch Co, 68 E 42nd St, New York, N. Y.
Babcock & Wilcox Co, 85 Liberty St, New York, N. Y.
Adv pages 8, 9, 10, 11
Bernitz Furnace Appliance Co, 89 Broad St, Boston, Mass.
Bigelow Co, 200–220 River St, New Haven, Conn.
Bigelow-Liptak Corp, 2840 W Grand Blvd, Detroit, Mich.
Brady Conveyors Corp, 20 W Jackson Blvd, Chicago, Ill.
Carborundum Co, Dept P, Perth Amboy, N. J.
Chicago Fire Brick Co, 1463 Elston Ave, Chicago, Ill.
Detrick, M H, Co, 140 S Dearborn St, Chicago, Ill.
DeWolf Furnace Corp, 77 South Ave, Rochester, N. Y.
Furnace Economy Co, 210 N Wells St, Chicago, Ill.
Green, A P, Firebrick Co, 1020 Breckenridge, Mexico, Mo.
Harbison-Walker Refractories Co, 1800 Farmers Bank Bldg, Pittsburgh, Pa.
International Engrg Wks Inc, Framingham, Mass.
Laclede-Christy Clay Products Co, 411 N 7th St, St Louis, Mo.
McLeod & Henry Co, Inc, 31 Monroe St, Troy, N. Y.
Mexico Refractories Co, Mexico, Mo.
Plibrico Jointless Firebrick Co, 1818 Kingsbury, Chicago, Ill.
Adv pages 205, 206, 255, 282
Ramtite Co, 2563 W 18th St, Chicago, Ill.
Reintjes, Geo P, Co, 2517 Jefferson, Kansas City, Mo.
Ryerson, Jos T, & Sons Inc, 16th & Rockwell Sts, Chicago, Ill.
Vitrefax Corp, 5050 Pacific Blvd, Los Angeles, Cal.
Wickes Boiler Co, 515 N Washington Ave, Saginaw, Mich.

YOU CAN PREVENT

COMBUSTION EXPLOSIONS

regardless of fuel burned

The Wheelco FLAME-OTROL

—provides instantaneous shut-off of fuel supply in case of flame failure. It is the only combustion safeguard approved by both the Underwriters' Laboratories and the Associated Factory Mutual Laboratories for all types of fuel. The FLAME-OTROL is available with automatic or manual ignition, time delay for purging, or any other sequence of operation desired.

Bulletin L2 gives complete information. Request your FREE copy TODAY!

Wheelco Instruments Co.

863 W. HARRISON STREET . . . . CHICAGO, ILLINOIS

Originator of "Electronic Principle" Temperature Controls.

ONE ORGANIZATION TO HANDLE ALL WATER PROBLEMS

Three Divisions to serve you:

1. Consulting Division—See Page
2. Engineering Service Division—See Page
3. Laboratory Supply Division—See Page

W. H. & L. D. Betz is an organization of engineers and chemists trained in the analysis and conditioning of one raw material—WATER. Betz service includes consultation and supervision of Industrial and Municipal water as well as industrial waste and sewage disposal.

W. H. & L. D. BETZ

Consultants on ALL Water Problems

FRANKFORD • PHILADELPHIA • PENNA.

LABORATORIES AND ENGINEERS LOCATED THROUGHOUT U. S. A. AND CANADA

ASBESTOS PACKING
(See Packing, Asbestos)

ASBESTOS PRODUCTS
(See Also Boards, Insulation, Pipe and Packing)

American Optical Co, Southbridge, Mass.
Baldwin-Hill Co, 575 Klagg Ave, Trenton, N. J.
Adv pages 204, 209, 238
Carey, Philip, Mfg Co, Lockland, Ohio
Adv page back cover
Ehret Magnesia Mfg Co, Inc, Valley Forge, Pa.
Adv page 157
Gatke Corp, 228 N La Salle St, Chicago, Ill.
Johns-Manville, 22 E 40th St, New York, N. Y.
Adv pages 44, 45
Keasbey & Mattison Co, Butler Pike, Ambler, Pa.
Adv page 137
Manhattan Rubber Mfg Div, 94 Townsend St, Passaic, N. J.
Porter, H W, & Co, 825 Frelinghuysen Ave, Newark, N. J.
Adv page 214
Standard Asbestos Mfg Co, 820 West Lake St, Chicago, Ill.
Thermoid Rubber Div, Whitehead Rd, Trenton, N. J.
Union Asbestos & Rubber Co, 1811 S 54th Ave, Cicero, Ill.
Adv pages 204, 238, 248, 273

ASH-HANDLING EQUIPMENT
(See Conveyors, Sluices, Storage)

ASPHALT-BASE PAINT
(See Paint, Bituminous)

AUTOMATIC CLUTCHES
(See Clutches, Automatic)

BAFFLES, BOILER
Acme Brick Co, Ft Worth, Tex.
Babcock & Wilcox Co, 85 Liberty St, New York, N. Y.
Adv pages 8, 9, 10, 11
Chicago Fire Brick Co, 1463 Elston Ave, Chicago, Ill.
Engineer Co, 75 West St, New York, N. Y.
Adv page 185
Harbison-Walker Refractories Co, 1800 Farmers Bank Bldg, Pittsburgh, Pa.
Laclede-Christy Clay Products Co, 411 N 7th St, St. Louis, Mo.
Mexico Refractories Co, Mexico, Mo.
Plibrico Jointless Firebrick Co, 1818 Kingsbury, Chicago, Ill.
Adv pages 205, 206, 255, 282
Power Plant Efficiency Co, E Market St, Indianapolis, Ind.
Quigley Co, 56 W 45th St, New York, N. Y.
Ramtite Co, 2563 W 18th St, Chicago, Ill.
Reintjes, Geo P, Co, 2517 Jefferson, Kansas City, Mo.
Seabord Refractories Co, Box 151, Perth Amboy, N. J.
Smith, Sanford C, Refractories Inc, 1715 Niagara St, Buffalo, N. Y.
Vitrefax Corp, 5050 Pacific Blvd, Los Angeles, Cal.

ASBESTOS SPECIALTIES

INSUTAPE—
The outstanding ribbon type heat insulation for spiral winding on short lengths of pipe, hard-to-get-at places, "tight spots," etc. Efficient . . . durable . . . high re-use value . . . choice of sizes.

INSUTUBE—
An ingenious, new idea in flexible heat insulation for slipping over small diameter tubes, pipes, coils, etc. Used on small, hot air heating pipes in airliners.

We are always glad to quote on asbestos specialties to meet individual requirements. Write.

UNARCO
UNION ASBESTOS & RUBBER CO.
1811 S. 54th Ave., Cicero, Illinois
CHICAGO—310 S. Michigan Ave. NEW YORK—420 Lexington Ave.
SAN FRANCISCO—116 New Montgomery St.
Contractor-Distributors Located in Principal Industrial Centers

BALANCED VALVES
(See Valves, Balanced)

BAROMETERS
Bristol Co, Waterbury, Conn.
Burrell Technical Supply Co, 1936 Fifth Ave, Pittsburgh
Foxboro Co, 38 Neponset Ave, Foxboro, Mass.
Friez, Julien P, & Sons, 4 N Central Ave, Baltimore, Md.
Tagliabue, C J Mfg Co, Park & Nostrand Aves, Brooklyn, N. Y.
Taylor Instrument Cos, Rochester, N. Y.
Uehling Instrument Co, 470 Getty Ave, Paterson, N. J.

BASES, MOTOR
Alexander Bros, 410 N 3rd St, Philadelphia, Pa.
Allis-Chalmers Mfg Co, Milwaukee, Wis.
Adv pages 6, 7
American Pulley Co, 4200 Wissahickon Ave, Philadelphia, Pa.
Chicago Belting Co, Chicago, Ill.
General Electric Co, Schenectady, N. Y.
Adv pages 32, 33
Grand Rapids Blow Pipe & Dust Arrester Co, Grand Rapids, Mich.
Ideal Commutator Dresser Co, 1025 Park Ave, Sycamore, Ill.
Korfund Co, 48-23 32nd Place, Long Island City, N. Y.
Littleford Bros, 457 E Pearl St, Cincinnati, Ohio
Rockwood Mfg Co, 1801 English Ave, Indianapolis, Ind.

BATTERIES, STORAGE
Edison, Thomas A, Inc, West Orange, N. J.
Electric Storage Battery Co, Allegheny Ave & 19th St, Philadelphia, Pa.
Adv page 183
Graybar Electric Co, 420 Lexington Ave, New York, N. Y.
Adv pages 214, 234, 243, 261, 265, 282, 284
Philadelphia Storage Battery Co, Ontario & C Sts, Phila, Pa.
Philco Corp, Storage Battery Div, Trenton, N. J.
Willard Storage Battery Co, 246 E 131 St, Cleveland, Ohio

BEARINGS, ANTI-FRICTION
Ahlberg Bearing Co, 4732 Whipple St, Chicago, Ill.
Alpha Metal and Rolling Mills Inc, 363 Hudson Ave, Brooklyn, N. Y.
Atlantic Gear Works, 126 Lafayette St, New York, N. Y.
Bantam Bearings Corp, South Bend, Ind.
Chicago Pulley & Shafting Co, Chicago, Ill.
Dodge Mfg Co, Mishawaka, Ind.
Fafnir Bearing Co, 77 Booth St, New Britain, Conn.
Gwilliam Co, 370 Furman St, Brooklyn, N. Y.
H & O Machinery & Engrg Co, Euclid Ave & Esther St, Newark, N. J.
Hill Acme Co, 6400 Breakwater Ave, Cleveland, Ohio
Hyatt Bearings Div, General Motors Corp, Anderson, Ind.
Jeffrey Mfg Co, 932-99 N 4th St, Columbus, Ohio
Link-Belt Co, 519 N Holmes Ave, Indianapolis, Ind.
Adv page 3
McGill Mfg Co, 270 Indiana Ave, Valparaiso, Ind.
Magnolia Metal Co, 120 Bayway, Elizabeth, N. J.
Medart Co, 3548 De Kalb St, St. Louis, Mo.
Moccasin Bushing Co, 20th & Chestnut Sts, Chattanooga, Tenn.
National Lead Co, 111 Broadway, New York, N. Y.
New Departure Div, General Motors Corp, Bristol, Conn.
Nice Ball Bearing Co, 30th & Nicetown Lane, Phila, Pa.
Norma-Hoffman Bearings Corp, Stamford, Conn.
Precision Development Co, College Ave, Salisbury, Md.
Royersford Foundry & Machine Co, 75 Main, Royersford, Pa.
Shafer Bearing Corp, 35 E Wacker Drive, Chicago, Ill.
SKF Industries, Inc, Front St & Erie Ave, Philadelphia, Pa.
Standard Pressed Steel Co, Jenkintown, Pa.
Stephens-Adamson Mfg Co, 5 Ridgeway Ave, Aurora, Ill.
Adv pages 46, 47
Timken Roller Bearing Co, Canton, Ohio
Wood's, T B, Sons Co, 1165 5th Ave, Chambersburg, Pa.

BEARINGS, OILLESS
American Crucible Products Co, Lorain, Ohio
Barry Co, Muscatine, Iowa
Bearium Metals Corp, 258 State St, Rochester, N. Y.
Bunting Brass & Bronze Co, Toledo, Ohio
Chicago Pulley & Shafting Co, Chicago, Ill.

B-H
HEAT INSULATION PRODUCTS
BALDWIN-HILL
MONO-BLOCK
Effective up to 1600° F

Covering the full range of temperatures up to 1600° F. with maximum efficiency, B-H MONO-BLOCK eliminates the need for 2 types of insulating block—one for low and one for high temperature. This block is preformed, fabricated of B-H chemically stable black rockwood fibres uniformly distributed, felted and bonded together to minimize heat flow. Easy to cut and apply, its surface conforming to obstructions such as rivet and bolt heads, small angles and welds. Made in sizes 18" and 36" long; 6", 12", 18" and 24" wide; 1" to 4" thick.

Send for Catalog showing complete line.

BALDWIN-HILL CO. 575 KLAGG AVE. TRENTON, N. J.
Branch Offices: NEW YORK KALAMAZOO, MICH.

Continental Diamond Fibre Co, Dept 18, Newark, Del.
Gatke Corp, 228 N La Salle St, Chicago, Ill.
Goodrich, B F, Co, 460 S Main St, Akron, Ohio
Johnson Bronze Co, New Castle, Pa.
Lignum-Vitae Products Corp, Jersey City, N. J.
Manhattan Rubber Mfg Div, 94 Townsend St, Passaic, N. J.
Neveroil Bearing Co, Wakefield, Mass.
Nolu Oilless Bearing Co, 16 E Johnson, Philadelphia, Pa.
Rhoades, R W, Metaline Co, 50-19 5th St, Long Island City, N. Y.
U. S. Graphite Co, 1621 Holland Ave, Saginaw, Mich.
Westinghouse Electric & Mfg Co, East Pittsburgh, Pa.
Adv pages 60, 61

BEARINGS, SLEEVE

American Crucible Products Co, PO Box 398, Lorain, Ohio
Bearium Metals Corp, 258 State St, Rochester, N. Y.
Bunting Brass & Bronze Co, Toledo, Ohio
Chrysler Corp, Amplex Div, P O Box 2718, Detroit, Mich.
Gatke Corp, 228 N La Salle St, Chicago, Ill.
Green Fuel Economizer Co, 627 Main St, Beacon, N. Y.
Hill Acme Co, 6400 Breakwater Ave, Cleveland, Ohio
Johnson Bronze Co, New Castle, Pa.
Kingsbury Machine Works, Inc, 4324 Tackawanna St, Phila.
Link-Belt Co, 2410 W 18th St, Chicago, Ill.
Adv page 3
Magnolia Metal Co, 120 Bay Way, Elizabeth, N. J.
Moccasin Bushing Co, 20th & Chestnut Sts, Chattanooga, Tenn.
Neveroil Bearing Co, Wakefield, Mass.
Precision Development Co, College Ave, Salisbury, Md.
Saginaw Bearing Co, 825 S Water St, Saginaw, Mich.
Standard Pressed Steel Co, Jenkintown, Pa.
Wood's, T B, Sons Co, 1165 5th Ave, Chambersburg, Pa.

BEARINGS, THRUST

Ahlberg Bearing Co, 3025 W 47th St, Chicago, Ill.
Bantam Bearings Corp, South Bend, Ind.
Bearium Metals Corp, 258 State St, Rochester, N. Y.
Chicago Pulley & Shafting Co, Chicago, Ill.
Fafnir Bearing Co, 77 Booth St, New Britain, Conn.
Gatke Corp, 228 N La Salle St, Chicago, Ill.
Gwilliam Co, 370 Furman St, Brooklyn, N. Y.
Hill Acme Co, 6400 Breakwater Ave, Cleveland, Ohio
Howarth Pivoted Bearings Co, Ontario & 23rd Sts, Phila.
Jeffrey Mfg Co, 932-99 N 4th St, Columbus, Ohio
Kingsbury Machine Works, 4324 Tackawanna St, Phila, Pa.
Link-Belt Co, 519 N Holmes Ave, Indianapolis, Ind.
Adv page 3
Moccasin Bushing Co, 20th & Chestnut Sts, Chattanooga, Tenn.
Nice Ball Bearing Co, 30th & Nicetown Lane, Phila, Pa.
Norma-Hoffman Bearings Corp, Stamford, Conn.
Precision Development Co, College Ave, Salisbury, Md.
Saginaw Bearing Co, 825 S Water St, Saginaw, Mich.
SKF Industries, Inc, Front St & Erie Ave, Philadelphia, Pa.
Timken Roller Bearing Co, Canton, Ohio

BELT CONVEYORS

(See Conveyors)

BELT DRESSING

(See Dressing, Belt)

BELT LACING

(See Lacing, Belt)

BELTING, CONVEYOR

Baldwin Belting & Leather Co, 85 Chambers St, New York, N. Y.
Boston Woven Hose & Rubber Co, Cambridge, Mass.
Brady Conveyors Corp, 20 W Jackson Blvd, Chicago, Ill.
Cincinnati Rubber Mfg Co, 4901 Franklin Ave, Cincinnati, O.
Dick, R & J, Co, Colfax Ave, Passaic, N. J.
Gifford-Wood Co, 24 Hill St, Hudson, N. Y.
Goodrich, B F, Co, 460 S Main St, Akron, Ohio
Goodyear Tire & Rubber Co, 1144 E Market St, Akron, O.
Jeffrey Mfg Co, 932-99 N 4th St, Columbus, Ohio
Link-Belt Co, 300 W Pershing Rd, Chicago, Ill.
Adv page 3
Manhattan Rubber Mfg Div, 94 Townsend St, Passaic, N. J.
Manheim Mfg & Belting Co, 375 Steigel St, Manheim, Pa.
New York Belting & Packing Co, Passaic, N. J.
Quaker City Rubber Co, Comly & Milnor Sts, Philadelphia, Pa.
Raniville, F, Co, Grand Rapids, Mich.
Republic Rubber Div, Lee Tire & Rubber Corp, Youngstown, Ohio
Robins Conveying Belt Co, Passaic, N. J.
Adv page 188
Scandinavia Belting Co, 250 Central Ave, Newark, N. J.
Stanley Belting Corp, 15 N Jefferson St, Chicago, Ill.
Stephens-Adamson Mfg Co, 5 Ridgeway Ave, Aurora, Ill.
Adv page 175
Thermoid Rubber Div, Trenton, N. J.
U. S. Rubber Co, 1230 6th Ave, New York, N. Y.
Wickwire Spencer Steel Co, 500 Fifth Ave, New York, N. Y.

BELTING, LEATHER

Alexander Bros, 410 N 3rd St, Philadelphia, Pa.
Baldwin Belting & Leather Co, 85 Chambers St, New York
Bond, Charles, Co, 617-623 Arch St, Philadelphia, Pa.
Chicago Belting Co, Chicago, Ill.
Chicago Rawhide Mfg Co, Chicago, Ill.
Fisher Leather Belting Co, Philadelphia, Pa.
Graton & Knight Co, Worcester, Mass.
Himmelein & Bailey Inc, 1300 Walnut St, Camden, N. J.
Houghton, E F, & Co, 244-50 W Somerset, Philadelphia, Pa.
Laurence Belting Co, 111 Chambers St, New York, N. Y.
Page Belting Co, Concord, N. H.
Pennwell Oil & Belting Co, Inc, 5 White St, New York, N. Y.
Philadelphia Belting Co, 6th & Spring Garden Sts, Philadelphia, Pa.
Raniville, F, Co, Grand Rapids, Mich.
Rhoads, J E, & Sons, 35 N 6th St, Philadelphia, Pa.
Schieren, Chas A, Co, 30-39 Ferry St, New York, N. Y.
Schwartz Belting Co, 74 Murray St, New York, N. Y.
Slip-Not Belting Corp, Kingsport, Tenn.
Whiting Leather & Belting Co, 9 Murray St, New York, N. Y.
Williams, I B, & Sons, 73 Murray St, New York, N. Y.

BELTING, RUBBER

Boston Woven Hose & Rubber Co, Cambridge, Mass.
Cincinnati Rubber Mfg Co, 4901 Franklin Ave, Cincinnati, O.
Garlock Packing Co, 400 Main St, Palmyra, N. Y.
Adv page 42
Gates Rubber Co, Denver, Colo.
Gilmer, L H, Co, 7360 Keystone St, Tacony, Phila, Pa.
Goodrich, B F, Co, 460 S Main St, Akron, Ohio
Goodyear Tire & Rubber Co, 1144 E Market St, Akron, O.
Hewitt Rubber Co, Buffalo, N. Y.
Jeffrey Mfg Co, 932-99 N 4th St, Columbus, Ohio
Laurence Belting Co, 111 Chambers St, New York, N. Y.
Manhattan Rubber Mfg Div, 94 Townsend St, Passaic, N. J.
Manheim Mfg & Belting Co, 375 Steigel St, Manheim, Pa.
New York Belting & Packing Co, Passaic, N. J.
Pioneer Rubber Mills, 345 Sacramento St, San Francisco, Cal.
Quaker City Rubber Co, Comly & Milnor Sts, Phila, Pa.
Raniville, F, Co, Grand Rapids, Mich.
Republic Rubber Div, Lee Tire & Rubber Corp, Youngstown, Ohio
Rockwood Mfg Co, 1801 English Ave, Indianapolis, Ind.
Schieren, Chas A, Co, 30-39 Ferry St, New York, N. Y.
Thermoid Rubber Div, Trenton, N. J.
U. S. Rubber Co, 1230 6th Ave, New York, N. Y.

BELTS, "V"

Allis-Chalmers Mfg Co, Milwaukee, Wis.
Adv pages 6, 7
American Pulley Co, 4200 Wisahickon Ave, Philadelphia, Pa.
Baldwin Belting & Leather Co, 85 Chambers St, New York, N. Y.
Chicago Belting Co, Chicago, Ill.
Continental Rubber Wks, Erie, Pa.
Dayton Rubber Mfg Co, Dayton, Ohio
Dick, R & J, Co, Inc, Colfax Ave, Passaic, N. J.
Gates Rubber Co, Denver, Colo.
Gilmer, L H, Co, 7360 Keystone St, Tacony, Philadelphia, Pa.
Goodrich, B F, Co, 460 S Main St, Akron, Ohio
Goodyear Tire & Rubber Co, 1144 E Market St, Akron, O.
Laurence Belting Co, 111 Chambers St, New York, N. Y.
Manhattan Rubber Mfg Div, 94 Townsend St, Passaic, N. J.
Manheim Mfg & Belting Co, 375 Steigel St, Manheim, Pa.
Medart Co, 3548 De Kalb St, St. Louis Mo.
New York Belting & Packing Co, Passaic, N. J.
Page Belting Co, Concord, N. H.
Raniville, F, Co, Grand Rapids, Mich.
Republic Rubber Div, Lee Tire & Rubber Corp, Youngstown, Ohio
Rockwood Mfg Co, 1801 English Ave, Indianapolis, Ind.
Schieren, Chas A, Co, 30-39 Ferry St, New York, N. Y.
Thermoid Rubber Div, Trenton, N. J.
U. S. Rubber Co, 1230 6th Ave, New York, N. Y.
Wood's, T B, Sons Co, 1165 5th Ave, Chambersburg, Pa.

BIN GATES

Beaumont Birch Co, 1505 Race St, Philadelphia, Pa.
Bethlehem Steel Co, Bethlehem, Pa.
Brady Conveyors Corp, 20 W Jackson Blvd, Chicago, Ill.
Fairfield Engrg Co, 305 Barnhart St, Marion, Ohio.
Fuller Co, 111 Bridge St, Catasaqua, Pa.
Adv pages 213, 253
Gifford-Wood Co, 24 Hill St, Hudson, N. Y.
Grand Rapids Blow Pipe & Dust Arrester Co, Grand Rapids, Mich.
Jeffrey Mfg Co, 932-99 N 4th St, Columbus, Ohio
Link-Belt Co, 300 W Pershing Road, Chicago, Ill.
Adv page 3
McNally Pittsburg Mfg Corp, Pittsburg, Kans.
Robins Conveying Belt Co, Passaic, N. J.
Adv page 188
Stephens-Adamson Mfg Co, 5 Ridgeway Ave, Aurora, Ill.
Adv page 175
Stock Engrg Co, 9805 Theodore Ave, Cleveland, Ohio
Adv page 164

BLAST GATES

Rockwell, W S, Co, 50 Church St, New York, N. Y.
Adv page 152

BLOWDOWN SYSTEMS, BOILER, CONTINUOUS

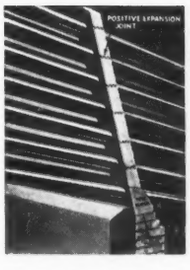
Cochrane Corp, 3106 N 17th St, Philadelphia, Pa.
Adv pages 154, 233, 240, 261
Dearborn Chemical Co, 310 S Michigan Ave, Chicago, Ill.
Elgin Softener Corp, 130 N Grove Ave, Elgin, Ill.
Adv page 283
Henszey Co, Dept D14, Watertown, Wis.
Madden, P E, Co, 352 W Walton St, Chicago, Ill.
Permutit Co, Dept A, 330 W 42 St, New York, N. Y.
Adv pages 152, 159
Scaife, Wm B, & Sons Co, River & Ann St, Oakmont, Pa.
Steam & Combustion Co, Racine, Wis.
Strong, Carlisle & Hammond Co, 1392 W 3rd, Cleveland, O.
Adv page 285

BLOWERS

(See Also Fans, Turbo-Blowers)

Advance Aluminum Castings Corp, 2742 W 36th Pl, Chicago, Ill.
Allen Billmyre Corp, Daily News Bldg, New York, N. Y.
Allen, E H, & Co, Dept P, 22 Dorrance St, Boston, Mass.
Allis-Chalmers Mfg Co, Milwaukee, Wis.
Adv pages 6, 7
American Blower Corp, 6000 Russell St, Detroit, Mich.
American Coal Burner Co, E Superior St, Chicago, Ill.
Adv page 264
Bayley Blower Co, 1817 S 66th St, Milwaukee, Wis.
Beach-Russ Co, 50 Church St, New York, N. Y.
Breuer Electric Mfg Co, 5100 N Ravenswood Ave, Chicago, Ill.
Buffalo Forge Co, 488 Broadway, Buffalo, N. Y.
Adv page 199
Campbell Heating Co, Des Moines, Iowa
Carling Turbine Blower Co, 25 St John's Rd, Worcester, Mass.
Champion Blower & Forge Co, Lancaster, Pa.

BECO-TURNER BAFFLES



BECO-TURNER Baffles are inherently gas tight when constructed because the tubes are mortared into castable, self-hardening refractory material. They stay gas tight because their patented expansion joints (shown opposite) prevent cracks and leaks.

Installed at any angle or shape necessary to bring about most efficient heat transfer: maintain uniform gas velocity; reduce exit temperature; heighten efficiency and capacity; adaptable to all types of water tube boilers; modernize existing units. Beco-Turner cross baffles improve performance of bent-tube and low-head boilers.

Let us submit our recommendations for baffling your boilers. Catalog Free.
Complete installation service

PLIBRICO JOINTLESS FIREBRICK CO.
1818 KINGSBURY ST. CHICAGO, ILLINOIS

Chelsea Fan & Blower Co, 1206 Grove St, Irvington, N. J.
Clarage Fan Co, 619 Porter St, Kalamazoo, Mich.
Adv page 147
Coppus Engrg Corp, 350 Park Ave, Worcester, Mass.
De Laval Steam Turbine Co, Trenton, N. J.
Adv page 58
Diamond Iron Works, Inc, Minneapolis, Minn.
Eclipse Fuel Engineering Co, 707 South Main St, Rockford, Ill.
Elliott Co, Jeannette, Pa.
Adv pages 4, 5, 187
Erie Electric Co, 124 Church St, Buffalo, N. Y.
Adv page 244
Garden City Fan Co, 332 S Michigan Ave, Chicago, Ill.
General Electric Co, Schenectady, N. Y.
Adv pages 32, 33
Grand Rapids Blow Pipe & Dust Arrester Co, Grand Rapids, Mich.
Graybar Electric Co, 420 Lexington Ave, New York, N. Y.
Adv pages 214, 234, 243, 261, 265, 282, 284, 286
Green Fuel Economizer Co, Inc, 627 Main St, Beacon, N. Y.
Adv pages 24, 25
Hastings Air Conditioning Co, Hastings, Neb.
Ilg Electric Ventilating Co, Chicago, Ill.
Ingersoll-Rand Co, 11 Broadway, New York, N. Y.
Adv pages 172, 173
Jeffrey Mfg Co, 932-99 N 4th St, Columbus, Ohio
Johnson Fan & Blower Co, Dept P, 1319 W Lake, Chicago, Ill.
Kirk & Blum Mfg Co, 2831 Spring Grove Ave, Cincinnati, O.
Meyer Furnace Co, Peoria, Ill.
Niagara Blower Co, 6 E 45th St, New York, N. Y.
Palmers Mfg Co, Phoenix, Ariz.
Power Turbo-Blower Co, 30 Vesey St, New York, N. Y.
Roots-Connersville Blower Corp, Connersville, Ind.
Skinner Heating & Ventilating Co, 1930 N 9th, St Louis, Mo.
Spencer Turbine Co, 488 New Park Ave, Hartford, Conn.
Standard Electrical Tool Co, 1918 W 8th St, Cincinnati, Ohio
Sterling Blower Co, 791 Windsor St, Hartford, Conn.
Sturtevant, B F, Co, 47 Readville St, Boston, Mass.
Surface Combustion Corp, Toledo, Ohio
Trane Co, 2012 Cameron Ave, La Crosse, Wis.
U S Hoffman Mach Corp, 105 4th Ave, New York, N. Y.
Wing, L J Mfg Co, W 14th St & 7th Ave, New York, N. Y.
Adv page 194

BLOWERS, SCAVENGING & SUPERCHARGING

Allis-Chalmers Mfg Co, Milwaukee, Wis.
Adv pages 6, 7
American Blower Corp, 6000 Russell St, Detroit, Mich.
De Laval Steam Turbine Co, Trenton, N. J.
Adv page 58
Elliott Co, Jeannette, Pa.
Adv pages 8, 9
Ingersoll-Rand Co, 11 Broadway, New York, N. Y.
Adv pages 172, 173
Roots-Connersville Blower Corp, Connersville, Ind.
U S Hoffman Mach Corp, 105 4th Ave, New York, N. Y.

BLOWERS, SOOT

American Blower Corp, 6000 Russell St, Detroit, Mich.
Bayer Co, 4026 Chouteau Ave, St Louis Mo.
Brunt Equipment Co, 64 S Division St, Buffalo, N. Y.
Adv page 211
Diamond Power Specialty Corp, Box 288, Detroit, Mich.
Adv pages 116, 117
General Specialty Co, Inc, 67 Carroll St, Buffalo, N. Y.
Hahn Engineering Div, 233 Broadway, New York, N. Y.
Marion Machine Foundry & Supply Co, Marion, Ind.
Sturtevant, B F, Co, 47 Readville St, Boston, Mass.
Adv pages 40, 41
Vulcan Soot Blower Co, Du Bois, Pa.

BLUEPRINT MACHINES

(See Printing Machines)

BOARDS, ASBESTOS

Carey, Philip, Mfg Co, Lockland, Ohio
Adv page back cover
Ehret Magnesia Mfg Co, Inc, Valley Forge, Pa.
Adv page 157
Johns-Manville, 22 E 40th St, New York, N. Y.
Adv pages 44, 45
Keasbey & Mattison Co, Butler Pike, Ambler, Pa.
Adv page 137
Standard Asbestos Mfg Co, 820 W Lake St, Chicago, Ill.

BOARDS, GAGE

Bailey Meter Co, 1036 Ivanhoe Rd, Cleveland, Ohio
Adv pages 14, 15
Bristol Co, Waterbury, Conn.
Brown Instrument Co, 4490 Wayne Ave, Philadelphia, Pa.
Adv pages 51, 240, 254, 258, 266
Foxboro Co, 38 Neponset Ave, Foxboro, Mass.
Lonergan, J E, Co, 211 Race St, Phila, Pa.
Adv page 281
Republic Flow Meters Co, 2222 Diversey Pkwy, Chicago, Ill.
Adv pages 215, 221, 241, 280
Taylor Instrument Cos, Rochester, N. Y.

BOILER BLOWDOWN SYSTEMS

(See Blowdown Systems, Boiler, Continuous)

BOILER COMPOUNDS

(See Water Treatment, Softeners)

BOILER-DRUM PAINT

(See Coatings, Boiler-Drum and Tubes)

BOILER-TUBE CLEANERS

(See Cleaners, Boiler-Tube)

BOILER TUBES

(See Tubes, Boiler)

BOILERS, ELECTRIC

Bigelow Co, 200-220 River St, New Haven, Conn.
General Electric Co, Schenectady, N. Y.
Adv pages 32, 33
Hynes Electric Heating Co, West & Clinton Sts, Camden, N. J.
Westinghouse Electric & Mfg Co, East Pittsburgh, Pa.
Adv pages 60, 61

BOILERS, ENGINE-EXHAUST, WASTE-HEAT

Alco Products Div, 36 Church St, New York, N. Y.
Adv pages 56, 155
Davis Engrg Corp, 1064-16 East Grand St, Elizabeth, N. J.
Foster Wheeler Corp, 165 Broadway, New York, N. Y.
Adv pages 38, 39
Maxim Silencer Co, 85 Homestead Ave, Hartford, Conn.
Sims Co, Erie, Pa.

BOILERS, FIRE-TUBE

Bass Foundry & Mach Div, 1602 Hanna St, Fort Wayne, Ind.
Bigelow Co, 200-220 River St, New Haven, Conn.
Birchfield Boiler Inc, Tacoma, Wash.
Birmingham Boiler & Engrg Co, Birmingham, Ala.
Bros, Wm, Boiler & Mfg Co, Nicollet Island, Minneapolis, Minn.
Brownell Co, 301 N Findlay St, Dayton, Ohio
Burnham Boiler Corp, Irvington, N. Y.
California Steel Prod Co, Barrett & A Sts, Richmond, Calif.
Cleaver-Brooks Co, 5100 N 33rd St, Milwaukee, Wis.
Combustion Engrg Co, Inc, 205 Madison Ave, New York, N. Y.
Adv pages 16, 17
Eclipse Fuel Engrg Co, 707 S Main St, Rockford, Ill.
Erie City Iron Works, 1422 East Ave, Erie, Pa.
Farrar & Trefts, Inc, Buffalo, N. Y.
Fitzgibbons Boiler Co, Inc, 101 Park Ave, New York, N. Y.
Heilman Boiler Works, Allentown, Pa.
Hodge Boiler Works, East Boston, Mass.
International Engrg Wks, Inc, Framingham, Mass.
Keeler, E, Co, Williamsport, Pa.
Adv page 125
Kewanee Boiler Corp, Kewanee, Ill.
Kroeschell Boiler Co, Racine, Wis.
Leffel, James & Co, Springfield, Ohio
Lookout Boiler & Mfg Co, Chattanooga, Tenn.

Look for the noun in the product listing, for example:

"Condensers, Surface"

not

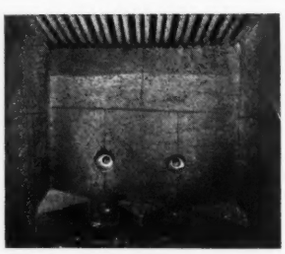
"Surface Condensers"

Mears-Kane-Ofeldt, Inc, 1903 E Hagert St, Philadelphia, Pa.
Milwaukee Reliance Boiler Works, Milwaukee, Wis.
Murray Iron Works Co, Burlington, Iowa
Adv page 148

PLIBRICO *Jointless* FIREBRICK

LASTS longer and gives more economical service than laid-up fire brick. Eliminates weak joints and loose brick; patented Flexo-Anchors prevent bulging. Saves fuel.

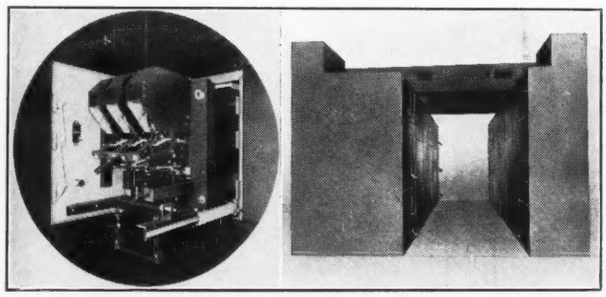
For patching, complete walls, full relining. Local Plibrico distributor will gladly quote on your repairs. Complete installation and boiler setting service in over 100 cities.



Catalog free.

PLIBRICO JOINTLESS FIREBRICK CO.

1818 KINGSBURY ST. CHICAGO, ILLINOIS



AIR CIRCUIT BREAKER SWITCHGEAR

For Power Plant Auxiliaries

Telescoping rails in each compartment permit ready insertion and quick removal of the breaker in Roller-Smith drawout type air circuit breaker switchboards. Breakers can be withdrawn without resorting to handling devices . . . with minimum effort . . . and with complete safety to both equipment and operator.

The sturdy R-S breakers are of the time-proved inverted contract design, taking advantage of the "loop" effect of the magnetic circuit to produce greatest contact pressure when such pressure is needed most.

Before you purchase any drawout-type switchboards investigate the Roller-Smith design. You'll find many features that will interest you. Write for Catalog 1230 today.

Electrical Measuring and Protective Apparatus
ROLLER-SMITH COMPANY BETHLEHEM, PENNA.
Sales Agencies in Principal Cities in U. S. and Canada

Pacific Steel Boiler Div, U. S. Radiator Corp, 1056 National Bank Bldg, Detroit, Mich.
Pennsylvania Boiler Works, Erie, Pa.
Pierce Butler Radiator Co, 701 Nichols Ave, Syracuse, N. Y.
Preferred Utilities Mfg Corp, New York, N. Y.
Titusville Iron Works Co, Titusville, Pa.
Union Iron Works, Erie, Pa.
Vogt, Henry, Machine Co, 1000 W Ormsby St, Louisville, Ky.
Adv page 46
Webster, Howard J. Greene & Hortter Sts, Philadelphia, Pa.
Wickes Boiler Co, 515 N Washington Ave, Saginaw, Mich.
Willamette Iron & Steel Corp, Portland, Ore.

BOILERS, WASTE-HEAT

American Locomotive Co, 30 Church St, New York, N. Y.
Adv pages 56, 155
Babcock & Wilcox Co, 85 Liberty St, New York, N. Y.
Adv pages 8, 9, 10, 11
Bigelow Co, 200-220 River St, New Haven, Conn.
Combustion Engrg Co, Inc, 205 Madison Ave, New York, N. Y.
Adv pages 16, 17
Edge Moor Iron Works, 30 Rockefeller Plaza, New York.
Adv page 182
Foster Wheeler Corp, 165 Broadway, New York, N. Y.
Adv pages 38, 39
Hodge Boiler Works, East Boston, Mass.
International Engrg Wks Inc, Framingham, Mass.
Koppers Co, Pittsburgh, Pa.
Maxim Silencer Co, 86 Homestead Ave, Hartford, Conn.
Riley Stoker Corp, 999 Neponset St, Worcester, Mass.
Adv pages 96, 97
Springfield Boiler Co, 1903 E Capitol Ave, Springfield, Ill.
Adv pages 28, 29
Vogt, Henry, Machine Co, 1000 W Ormsby St, Louisville, Ky.
Adv page 46

BOILERS, WATER-TUBE

Almy Water Tube Boiler Co, 184 Allens Ave, Providence, R. I.
American Steam Automobile Co, West Newton, Mass. (Miniature)
Babcock & Wilcox Co, 85 Liberty St, New York, N. Y.
Adv pages 8, 9, 10, 11
Bass Foundry & Machine Div, 1602 Hanna St, Fort Wayne, Ind.
Bigelow Co, 200-220 River St, New Haven, Conn.
Bros, Wm, Boiler & Mfg Co, Nicollet Id, Minneapolis, Minn.
Combustion Engrg Co, Inc, 205 Madison Ave, New York, N. Y.
Adv pages 16, 17
Edge Moor Iron Works, 30 Rockefeller Plaza, New York. N. Y.
Adv page 182
Erie City Iron Works, 1422 East Ave, Erie, Pa.
Foster Wheeler Corp, 168 Broadway, New York
Adv pages 38, 39
Heilman Boiler Works, Allentown, Pa.
International Boiler Works Co, E Stroudsburg, Pa.
International Engrg Wks Inc, Framingham, Mass.
Keeler, E, Co, Williamsport, Pa.
Adv page 125
Keeler, Godfrey, Co, Inc, 77 Warren St, New York, N. Y.
Kennedy-Van Saun Mfg & Engrg Corp, 2 Park Ave, New York, N. Y.
Kroeschell Boiler Co, Racine, Wis.
Leffel, James & Co, Springfield, O.
Mears-Kane-Ofeldt Inc, 1903 E Hagert St, Philadelphia, Pa.
Murray Iron Works Co, Burlington, Iowa
Adv page 148
Nagle Engine & Boiler Works, Erie, Pa.
Page Boiler Co, 815 W Webster Ave, Chicago, Ill.
Pierce Butler Radiator Corp, 701 Nichols Ave, Syracuse, N. Y.
Riley Stoker Corp, 999 Neponset St, Worcester, Mass.
Adv pages 96, 97
Springfield Boiler Co, 1903 E Capitol Ave, Springfield, Ill.
Adv pages 28, 29
Titusville Iron Works Co, Titusville, Pa.
Union Iron Works, Erie, Pa.
Vogt, Henry, Machine Co, 1000 W Ormsby St, Louisville, Ky.
Adv page 46
Wickes Boiler Co, 515 N Washington Ave, Saginaw, Mich.

BOXES, TOOL

Littleford Bros, 438 E Pearl St, Cincinnati, Ohio
Snap-on Tools Corp, Kenosha, Wis.

BRASS PIPE

(See Pipe, Brass and Copper)

BREAKERS, CIRCUIT, AIR

Allis-Chalmers Mfg Co, Milwaukee, Wis.
Adv pages 6, 7
Colt's Patent Firearms Mfg Co, 17 Van Dyke Ave, Hartford, Conn.
Cutler-Hammer, Inc, 315 N 12th St, Milwaukee, Wis.
Adv page 107
Delta-Star Electric Co, Fulton St, Chicago, Ill.
General Electric Co, Schenectady, N. Y.
Adv pages 32, 33
Graybar Electric Co, 420 Lexington Ave, New York, N. Y.
Adv pages 214, 234, 243, 261, 265, 282, 284
I-T-E Circuit Breaker Co, 19th & Hamilton St, Phila, Pa.
Roller-Smith Co, 1766 W Market St, Bethlehem, Pa.
Adv page 206
Square D Co, Rivard & Piquette Sts, Detroit, Mich.
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61

BREAKERS, CIRCUIT, OIL

Allis-Chalmers Mfg Co, Milwaukee, Wis.
Adv pages 6, 7
Delta-Star Electric Co, Fulton St, Chicago, Ill.
General Electric Co, Schenectady, N. Y.
Adv pages 32, 33
Graybar Electric Co, 420 Lexington Ave, New York, N. Y.
Adv pages 214, 234, 243, 261, 265, 282, 284
Littelfuse, Inc, 4757 Ravenswood Ave, Chicago, Ill.
Pacific Electric Mfg Corp, 5815 3rd St, San Francisco, Calif.
Roller-Smith Co, 1766 W Market St, Bethlehem, Pa.
Adv page 206
Southern States Equipment Corp, Birmingham, Ala.
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61

BREECHINGS

Alpha Tank & Sheet Metal Mfg Co, 5005 S 38th, St Louis, Mo.
Bass Foundry & Machine Div, 1602 Hanna St, Fort Wayne, Ind.
Bergen Point Iron Works, Bayonne, N. J.
Bethlehem Steel Co, Bethlehem, Pa.
Bigelow Co, 200-220 River St, New Haven, Conn.
Bros, Wm. Boiler & Mfg Co, Nicollet Id, Minneapolis, Minn.
Brownell Co, 301 N Findlay St, Dayton, Ohio
Caldwell, W E, Co, Inc, 280 Brandeis St, Louisville, Ky.
California Steel Products Co, Barrett & A Sts, Richmond, Cal.
Chattanooga Boiler & Tank Co, Box 110, Chattanooga, Tenn.
Chicago Bridge & Iron Co, 2454 McCormick Bldg, Chicago, Ill.
Colonial Iron Works Co, 17643 St Clair Ave, Cleveland, Ohio
Connery Construction Co, 2nd & Luzerne Sts, Phila, Pa.
Dover Boiler Works, 90 E Dickerson St, Dover, N. J.
Gifford-Wood Co, 24 Hill St, Hudson, N. Y.
Graver Tank & Mfg Co, Inc, East Chicago, Ind.
Green Fuel Economizer Co, Inc, 627 Main St, Beacon, N. Y.
Hodge Boiler Works, East Boston, Mass.
International Engrg Works, Inc, Framingham, Mass.
Keeler, E, Co, Williamsport, Pa.
Adv page 125
Kirk & Blum Mfg Co, 283 Spring Grove Ave, Cincinnati, Ohio
Littleford Bros, 457 E Pearl St, Cincinnati, Ohio
Long, Walter, Mfg Co, Pittsburgh, Pa.
Michelman Steel Constr Co, Quincy, Ill.
Portland Co, Portland, Maine
Richmond Engrg Co, 7th & Hospital Sts, Richmond, Va.
Stover Steel Tank & Mfg Co, Freeport, Ill.
Titusville Iron Works Co, Titusville, Pa.
Treadwell, M H, Co, 140 Cedar St, New York, N. Y.
Union Boiler & Mfg Co, 52 Vanderbilt, New York, N. Y.
Union Iron Works, Erie, Pa.
Wickes Boiler Co, 515 N Washington Ave, Saginaw, Mich.
Youngstown Steel Tank Co, Youngstown, Ohio

BRICK, FIRE

Acme Brick Co, Fort Worth, Tex.
Babcock & Wilcox Co, 85 Liberty St, New York, N. Y.
Adv pages 8, 9, 10, 11
Bernitz Furnace Appliance Co, 89 Broad St, Boston, Mass.
Bigelow-Liptak Corp, 2840 W Grand Blvd, Detroit, Mich.
Brooklyn Fire Brick Works, 88 Van Dyke St, Brooklyn, N. Y.
Carborundum Co, Dept P, Perth Amboy, N. J.
Chicago Fire Brick Co, 1463 Elston Ave, Chicago, Ill.
Denver Fire Clay Co, 2301 Blake St, Denver, Colo.
DeWolf Furnace Corp, 77 South Ave, Rochester, N. Y.
General Refractories Co, 1600 Real Estate Trust Bldg, Philadelphia, Pa.
Green, A P, Fire Brick Co, 1020 Breckenridge, Mexico, Mo.

Look for the noun in the product listing, for example:
"Condensers, Surface"
not
"Surface Condensers"

Hammond Fire Brick Co, Fairmont, W. Va.
Harbison-Walker Refractories Co, 1800 Farmers Bank Bldg, Pittsburgh, Pa.
Illinois Clay Products Co, Joliet, Ill.
Johns-Manville, 22 E 40th St, New York, N. Y.
Adv pages 44, 45
Laclede-Christy Clay Products Co, 411 N 7th, St. Louis, Mo.
Louisville Fire Brick Works, Inc, Louisville, Ky.
McLeod & Henry Co, Inc, 31 Monroe St, Troy, N. Y.
Mexico Refractories Co, Mexico, Mo.
North American Refractories Co, Nat'l City Bank Bldg, Cleveland, Ohio
Norton Co, Worcester, Mass.
Plibrico Jointless Firebrick Co, 1818 Kingsbury St, Chicago, Ill.
Adv pages 205, 206, 255, 282
Quigley Co, 56 W 45th St, New York, N. Y.
Ramtite Co, 2563 W 18th St, Chicago, Ill.
Seaboard Refractories Co, Box 151, Perth Amboy, N. J.
Vitrefax Corp, 5050 Pacific Blvd, Los Angeles, Cal.

BRICK, INSULATING

Acme Brick Co, Fort Worth, Texas
Babcock & Wilcox Co, 85 Liberty St, New York, N. Y.
Adv pages 8, 9, 10, 11
Carborundum Co, Dept P, Perth Amboy, N. J.
Chicago Fire Brick Co, 1463 Elston Ave, Chicago, Ill.
Ehret Magnesia Mfg Co, Inc, Valley Forge, Pa.
Adv page 157
Green, A P, Fire Brick Co, 1020 Breckenridge, Mexico, Mo.
Harbison-Walker Refractories Co, 1800 Farmers Bank Bldg, Pittsburgh, Pa.
Johns-Manville, 22 E 40th St, New York, N. Y.
Adv pages 44, 45
Laclede-Christy Clay Products Co, 411 N 7th Street, St Louis Mo.
Mexico Refractories Co, Mexico, Mo.
North American Refractories Co, Nat'l City Bank Bldg, Cleveland, Ohio
Plibrico Jointless Firebrick Co, 1818 Kingsbury St, Chicago, Ill.
Adv pages 205, 206, 255, 282
Quigley Co, Inc, 56 W 45th St, New York, N. Y.
Seaboard Refractories Co, Box 151, Perth Amboy, N. J.
Universal Zonolite Insulation Co, 135 South La Salle St, Chicago, Ill.
Vitrefax Corp, 5050 Pacific Blvd, Los Angeles, Cal.

BRINE COOLERS

(See Coolers, Brine)

BRUSHES, MOTOR, GENERATOR

Dixon, Jos, Crucible Co, 170 Wayne St, Jersey City, N. J.
Adv page 186
General Electric Co, Schenectady, N. Y.
Adv pages 32, 33
National Carbon Co, Carbon Sales Div, Cleveland, Ohio
Ohio Carbon Co, Cleveland, Ohio
Speer Carbon Co, 40 Theresia St, Saint Marys, Pa.
U. S. Graphite Co, Holland Ave, Saginaw, Mich.
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61

BUNKERS, COAL AND ASH

Allen-Sherman-Hoff Co, 227 S 15th St, Philadelphia, Pa.
Alpha Tank & Sheet Metal Mfg Co, 5005 S 38th St, St. Louis, Mo.
Bartlett & Snow, C O, Co, Cleveland, Ohio
Beaumont Birch Co, 1505 Race St, Philadelphia, Pa.
Bethlehem Steel Co, Bethlehem, Pa.
Brady Conveyors Corp, 20 W Jackson Blvd, Chicago, Ill.
Caldwell, W E, Co, Inc, 280 Brandeis St, Louisville, Ky.
Chain Belt Co, 1674 W Bruce St, Milwaukee, Wis.
Chattanooga Boiler & Tank Co, Box 110, Chattanooga, Tenn.
Colonial Iron Works Co, 17643 St Clair Ave, Cleveland, Ohio
Connery Construction Co, 2nd & Luzerne Sts, Phila, Pa.
Erie City Iron Works, 1422 East Ave, Erie, Pa.
Fairfield Engrg Co, 305 Barnhart St, Marion, Ohio
Frederick Iron & Steel Co, Frederick, Md.
Gifford-Wood Co, 24 Hill St, Hudson, N. Y.
Hahn Engrg Div, 233 Broadway, New York, N. Y.
Jeffrey Mfg Co, 932-99 N 4th St, Columbus, Ohio
Kennedy-Van Saun Mfg & Engrg Corp, 2 Park Ave, New York, N. Y.
Link-Belt Co, 300 W Pershing Road, Chicago, Ill.
Adv page 3
McNally Pitsburg Mfg Co, Pittsburg, Kans.
Michelman Steel Construction Co, Quincy, Ill.
Robins Conveying Belt Co, Passaic, N. J.
Adv page 188
Stearns-Roger Mfg Co, Denver, Colo.
Stephens-Adamson Co, 5 Ridgeway Ave, Aurora, Ill.
Adv page 175

United Conveyor Corp, Dearborn & Van Buren Sts, Chicago, Ill.

BURNERS, GAS

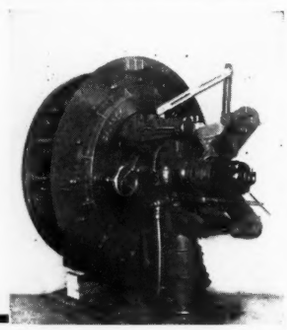
Anthony Co, 47-33 5th St, Long Island City, N. Y.
Best, W N, Engrg Co, 90 West St, New York, N. Y.
Adv page 208
Chicago Flexible Shaft Co, Chicago, Ill.
Coen Co, 40 Boardman Place, San Francisco, Cal.
Combustion Equipment Co, 1820 Cherry St, Kansas City, Mo.
Coppus Engrg Corp, 350 Park Ave, Worcester, Mass.
Denver Fire Clay Co, 2301 Blake St, Denver, Colo.
Diamond Iron Wks & Mahr Mfg Co, Div, Minneapolis, Minn.
Eclipse Fuel Engrg Co, 707 S Main St, Rockford, Ill.
Engineer Co, 75 West St, New York, N. Y.
Adv page 185
Hauck Mfg Co, 126 10th St, Brooklyn, N. Y.
Leahy Mfg Co, E 8th St, Los Angeles, Calif.
Martin, J O & C U, 637 Minna St, San Francisco, Cal.
National Airoil Burner Co, 1284 E Sedgley Ave, Philadelphia, Pa.
Natural Gas Equipment, Inc, 539 Petroleum Bldg, Los Angeles, Calif.
Peabody Engrg Corp, 580 5th Ave, New York, N. Y.
Adv page 153
Ray Oil Burner Co, 401 Bernal Ave, San Francisco, Calif.
Staples & Pfeiffer Ltd, 528 Bryant St, San Francisco, Calif.
Steam & Combustion Co, Racine, Wis.
Surface Combustion Corp, Sieloff St, Toledo, Ohio
Tate-Jones & Co, 23 Broad St, Leetsdale, Pa.
Todd Combustion Equipment, 601 W 26th St, New York.
York Ice Machinery Corp, York, Pa.

BURNERS, GAS AND OIL, COMBINED

Anthony Co, 47-33 5th St, Long Island City, N. Y.
Babcock & Wilcox Co, 85 Liberty St, New York, N. Y.
Adv pages 8, 9, 10, 11
Best, W N, Engrg Co, 90 West St, New York, N. Y.
Adv page 208
Coen Co, 40 Boardman Place, San Francisco, Calif.
Combustion Equipment Co, 1820 Cherry St, Kansas City, Mo.
Coppus Engineering Corp, 350 Park Ave, Worcester, Mass.
Engineer Co, 75 West St, New York, N. Y.
Adv page 185
Johnson, S T, Co, Oakland, Calif.
Leahy Mfg Co, E 8th St, Los Angeles, Calif.
Natural Gas Equipment, Inc, 539 Petroleum Bldg, Los Angeles, Calif.
Peabody Engrg Corp, 580 5th Ave, New York, N. Y.
Adv page 153
Ray Oil Burner Co, 401 Bernal Ave, San Francisco, Calif.
Rockwell, W S, Co, 50 Church St, New York, N. Y.
Adv page 152
Staples & Pfeiffer Ltd, 528 Bryant St, San Francisco, Cal.
Steam & Combustion Co, Racine, Wis.
Surface Combustion Corp, Sieloff St, Toledo, Ohio
York Oil Burner Co, York, Pa.

BURNERS, OIL

Aeroil Burner Co, Inc, 5703 Park Ave, West New York, N. J.
American Radiator & Std Sanitary Corp, 40 W 40th St, New
Anthony Co, 47-33 5th St, Long Island City, N. Y.
Babcock & Wilcox Co, 85 Liberty St, New York, N. Y.
Adv pages 8, 9, 10, 11
Best, W N, Engrg Co, 90 West St, New York, N. Y.
Adv page 208
Cashin, W D Co, 69 A St, Boston, Mass.
Chicago Flexible Shaft Co, Chicago, Ill.
Coen Co, 40 Boardman Place, San Francisco, Calif.
Combustion Engrg Co, Inc, 205 Madison Ave, New York, N. Y.
Adv pages 16, 17
Combustion Equipment Co, 1820 Cherry St, Kansas City, Mo.
Denver Fire Clay Co, 2301 Blake St, Denver, Colo.
Diamond Iron Wks & Mahr Mfg Co, Div, Minneapolis Minn.
Engineer Co, 75 West St, New York, N. Y.
Adv page 185
Enterprise Oil Burner Co, 2902 19th St, San Francisco, Cal.
Gilbert & Barker Mfg Co, Springfield, Mass.
Hadley, F V, Co, 127 Federal St, Boston, Mass.



CALOREX

INDUSTRIAL BURNERS for LIQUID and GASEOUS FUELS

Every industrial requirement can be met with "CALOREX" equipment. Included are Oil, Tar and Colloidal Fuel Burners as well as combination Oil and Gas Burners.

2500 lb. capacity BESTROL OIL BURNER complete with air register and full antomatic combustion control which interlocks all combustion components to a single control connection.

Calorex types include:

Atomizing burners using steam, medium and high pressure air; stationary tip low pressure air; mechanical burners employing high and low pressure, electric driven rotary cup type; fuel oil pumping and heating units, steam or electrically actuated and atomizing air supply types.

In addition the CALOREX line includes a wide variety of accessory equipment such as automatic combustion control, interlocking valves, strainers, etc.

"Series 10" CALOREX EXTERNAL ATOMIZING BURNER with capacity for firing from 5 to 350 gal. per hour

Ask our engineers for assistance on your problems. Send for engineering literature giving valuable, interesting information.

W. N. BEST ENGINEERING CO., INC.

Manufacturers of Industrial Oil and Gas Burning Equipment

138 Cedar St. New York, N. Y.

Look for the noun in the product listing, for example:
"Conduit, Electrical"
not
"Electrical Conduit"

Hagan, George J, Co, Pittsburgh, Pa.
Hammel Oil Burner Co, Los Angeles, Calif.
Hauck Mfg Co, 126 10th St, Brooklyn, N. Y.
Johnson, S T, Co, 940 Arlington, Oakland, Cal.
Lammert & Mann Co, 215-21 North Wood St, Chicago, Ill.
Leahy Mfg Co, E 8th St, Los Angeles, Calif.
Macleod Co, 2236 Bogen St, Cincinnati, Ohio
National Airoil Burner Co, 1284 E Sedgley Ave, Philadelphia, Pa.
Natural Gas Equipment, Inc, 539 Petroleum Bldg, Los Angeles, Calif.
Peabody Engrg Corp, 580 5th Ave, New York, N. Y.
Adv page 153
Petroleum Heat & Power Co, Stamford, Conn.
Preferred Utilities Mfg Corp, New York, N. Y.
Ray Oil Burner Co, 411 Bernal Ave, San Francisco, Calif.
Riley Stoker Corp, 999 Neponset St, Worcester, Mass.
Adv page 96, 97
Rockwell, W S, Co, 50 Church St, New York, N. Y.
Adv pages 152
Schutte & Koerting Co, 12th & Thompson Sts, Phila, Pa.
Seal-O-Strain Corp, 123 DeKalb Ave, Brooklyn, N. Y.
Simplex Oil Heating Corp, 191 Central Ave, Newark, N. J.
Staples & Pfeiffer Ltd, 528 Bryant St, San Francisco, Cal.
Steam & Combustion Co, Racine, Wis.
Tate-Jones & Co, Inc, 23 Broad St, Leetsdale, Pa.
Todd Combustion Equipment, 601 W 26th St, New York, N. Y.
York Oil Burner Co, York, Pa.

BURNERS, PULVERIZED-COAL

Babcock & Wilcox Co, 85 Liberty St, New York, N. Y.
Adv pages 8, 9, 10, 11
Combustion Engrg Co, Inc, 205 Madison Ave, New York, N. Y.
Adv pages 16, 17
Erie City Iron Works, 1422 East Ave, Erie, Pa.
Foster Wheeler Corp, 165 Broadway, N. Y.
Adv pages 38, 39
Kennedy-Van Saun Mfg & Engrg Corp, 2 Park Ave, New York, N. Y.
Peabody Engrg Corp, 580 5th Ave, New York, N. Y.
Adv page 153
Riley Stoker Corp, 999 Neponset St, Worcester, Mass.
Adv pages 96, 97
Strong-Scott Mfg Co, NW Terminal, Minneapolis, Minn.
Whiting Corp, 156 Lathrop Ave, Harvey, Ill.
Whiting Stoker Co, 4711 W North Ave, Chicago, Ill.

BURNERS, PULVERIZED-COAL, OIL AND GAS COMBINED

Babcock & Wilcox Co, 85 Liberty St, New York, N. Y.
Adv pages 8, 9, 10, 11
Combustion Engrg Co, Inc, 205 Madison Ave, New York, N. Y.
Adv pages 16, 17
Erie City Iron Works, 1422 East Ave, Erie, Pa.
Foster Wheeler Corp, 165 Broadway, New York, N. Y.
Adv pages 38, 39
Kennedy-Van Saun Mfg & Engrg Corp, 2 Park Ave, New York, N. Y.
Peabody Engrg Corp, 580 5th Ave, New York, N. Y.
Adv page 153
Riley Stoker Corp, 999 Neponset St, Worcester, Mass.
Adv pages 96, 97

CABLE

(See Wire & Cable, Electric)

CALORIMETERS, STEAM

Burrell Technical Supply Co, 1936 Fifth Ave, Pitsburgh, Pa.
Ellison Draft Gage Co, 214 W Kinzie St, Chicago, Ill.

CAPACITORS

General Electric Co, Schenectady, N. Y.
Adv pages 32, 33
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61

CAR UNLOADERS

Beaumont-Birch Co, 1505 Race St, Phila, Pa.
Brady Conveyors Corp, 20 W Jackson Blvd, Chicago, Ill.
Fairfield Engrg Co, 305 Barnhart St, Marion, Ohio
Jeffrey Mfg Co, 932–99 N 4th St, Columbus, Ohio
Link-Belt Co, 300 W Pershing Rd, Chicago, Ill.
Adv page 3
Robins Conveying Belt Co, Passaic, N. J.
Adv page 188
Wellman Engrg Co, 7000 Central Ave, Cleveland, Ohio

CARBON BRUSHES

(See Brushes, Motor, Gen)

CARS, COAL AND ASH

Bergen Point Iron Works, Bayonne, N. J.
Bethlehem Steel Co, Bethlehem, Pa.
Gifford-Wood Co, 24 Hill St, Hudson, N. Y.
Pressed Steel Car Co, Inc, Pittsburgh, Pa.
Stephens-Adamson Mfg Co, 5 Ridgeway Ave, Aurora, Ill.
Adv page 175

CAST-IRON PIPE

(See Pipe, Cast-Iron)

CASUALTY INSURANCE

Continental Casualty Co, 910 S Michigan Ave, Chicago, Ill.
Globe Indemnity Co, 150 William St, New York, N. Y.
Hartford Steam Boiler Inspection & Ins Co, Hartford, Conn.
Insurance Co of North America, 1600 Arch St, Phila, Pa.
Maryland Casualty Co, Baltimore, Md.
Mutual Boiler Insurance Co of Boston, 60 Batterymarch, Boston, Mass.
Ocean Accident & Guarantee Corp, 1 Park Ave, New York.
Royal Indemnity Co, 150 William St, New York, N. Y.
Travelers Insurance Co, Hartford, Conn.
U S Fidelity & Guarantee Co, Baltimore, Md.

CEMENT, ACID-RESISTANT

Brown, David C, Co, 17532 Wisconsin, Detroit, Mich.

Haveg Corp, Newark, Del.
Johns-Manville, 22 E 40th St, New York, N. Y.
Adv pages 44, 45
Pennsylvania Salt Mfg Co, 1000 Widener Bldg, Phila, Pa.
Quigley Co, Inc, 56 W 45th St, New York, N. Y.
Stonhard Co, Terminal Commerce Bldg, Philadelphia, Pa.
U. S. Stoneware Co, 62 E 42nd St, New York, N. Y.

CEMENT, BELT

Baldwin Belting & Leather Co, 85 Chambers, New York, N. Y.
Graton & Knight Co, Worcester, Mass.
Laurence Belting Co, 111 Chambers St, New York, N. Y.
Monsanto Chemical Co, St Louis, Mo.
Page Belting Co, Concord, N. H.
Philadelphia Belting Co, 6th & Spring Garden Sts, Phila, Pa.
Raniville, F, Co, Grand Rapids, Mich.
Rhoads, J E, & Sons, 35 N 6th St, Philadelphia, Pa.
Schieren, Chas A, Co, 30–39 Ferry St, New York, N. Y.
Schwartz Belting Co, 74 Murray St, New York, N. Y.

CEMENT, INSULATING, HEAT

Acme Brick Co, Fort Worth, Texas
Baldwin-Hill Co, 575 Klagg Ave, Trenton, N. J.
Adv pages 204, 209, 238
Botfield Refractories Co, 776-82 S Swanson St, Philadelphia, Pa.
Adv page 255

Look for the noun in the product listing, for example:

"Arches, Boiler"

not

"Boiler Arches"

Carey, Philip, Mfg Co, Lockland, Ohio
Adv page back cover
Denver Fire Clay Co, 2301 Blake St, Denver, Colo.
Eagle-Picher Sales Co, P D 901, Temple Bar Bldg, Cincinnati, Ohio
Ehret Magnesia Mfg Co, Inc, Valley Forge, Pa.
Adv page 157
Green, A P, Firebrick Co, 1020 Breckenridge, Mexico, Mo.
Johns-Manville, 22 E 40th St, New York, N. Y.
Adv pages 44, 45
Keasbey & Mattison Co, Butler Pike, Ambler, Pa.
Adv page 137
Mexico Refractories Co, Mexico, Mo.
National Engrg Products, Inc, Commerce & Savings Bldg, Washington, D. C.
Owens-Corning Fiberglas Corp, Toledo, Ohio
Plibrico Jointless Firebrick Co, 1818 Kingsbury St, Chicago, Ill.
Adv pages 205, 206, 255, 282
Quigley Co, Inc, 56 W 45th St, New York, N. Y.
Refractory & Insulation Corp, 381 4th Ave, New York, N. Y.
So-Lo Works, 3317 Madison Road, Cincinnati, Ohio
Standard Asbestos Mfg Co, 820 W Lake St, Chicago, Ill.
Vitrefax Corp, 5050 Pacific Blvd, Los Angeles, Cal.

CEMENT, REFRACTORY

Acme Brick Co, Fort Worth, Texas
Armstrong Cork Co, Lancaster, Pa.
Adv page 218
Babcock & Wilcox Co, 85 Liberty St, New York, N. Y.
Adv pages 8, 9, 10, 11
Bernitz Furnace Appliance Co, 89 Broad St, Boston, Mass.
Botfield Refractories Co, 776-82 S Swanson St, Phila, Pa.
Adv page 255
Brooklyn Firebrick Works, 88 Van Dyke St, Brooklyn, N. Y.
Carborundum Co, Dept P, Perth Amboy, N. J.
Carolina Refractories Co, Hartsville, S. C.
Chicago Fire Brick Co, 1463 Elston Ave, Chicago, Ill.
Denver Fire Clay Co, 2301 Blake St, Denver, Colo.
Drake Non-Clinkering Furnace Block Co, Beekman St, New York, N. Y.
Faulkner, J A, Refractories Co, Youngstown, Ohio
General Refractories Co, 1600 Real Estate Trust Bldg, Philadelphia, Pa.
Green, A P, Fire Brick Co, 1020 Breckenridge, Mexico, Mo.
Harbison-Walker Refractories Co, 1800 Farmers Bank Bldg, Pittsburgh, Pa.
Johns-Manville, 22 E 40th St, New York, N. Y.
Adv pages 44, 45
Keystone Refractories Co, 120 Liberty St, New York, N. Y.
Adv page 255
Laclede-Christy Clay Products Co, 411 N 7th, St. Louis, Mo.
McLeod & Henry Co, Inc, 31 Monroe St, Troy, N. Y.
Mexico Refractories Co, Mexico, Mo.
National Engrg Products Co, Commerce & Savings Bldg, Washington, D. C.
North American Refractories Co, Nat'l City Bank Bldg, Cleveland, Ohio
Norton Co, Worcester, Mass.
Plibrico Jointless Firebrick Co, 1818 Kingsbury St, Chicago, Ill.
Adv pages 205, 206, 255, 282
Pyro Clay Products Co, Oak Hill, Ohio.
Quigley Co, Inc, 56 W 45th St, New York, N. Y.
Ramtite Co, 2563 W 18th St, Chicago, Ill.
Refractory & Insulation Corp, 381 Fourth Ave, New York, N. Y.
Seaboard Refractories Co, P O Box 151, Perth Amboy, N. J.
Smith, Sanford C, Refractories Co, 1715 Niagara St, Buffalo, N. Y.
Vitrefax Corp, 5050 Pacific Blvd, Los Angeles, Cal.

CENTRIFUGAL FANS

(See Fans, Centrifugal)

CENTRIFUGAL PUMPS

(See Pumps, Centrifugal)

CENTRIFUGES, OIL

See Purifiers, Oil, Centrifugal)

CHAINS AND SPROCKETS, POWER-TRANSMITTING

American Manganese Steel Div, 397 E 14th St, Chicago, Ill.
Atlantic Gear Works, 198 Lafayette St, New York, N. Y.
Baldwin-Duckworth Chain Corp, Springfield, Mass.
Bartlett & Snow, C O, Co, Cleveland, Ohio
Bond, Charles, Co, 617-623 Arch St, Philadelphia, Pa.
Boston Gear Works, Inc, North Quincy, Mass.
Bridgeport Chain & Mfg Co, Bridgeport, Conn.
Chain Belt Co, 1674 W Bruce St, Milwaukee, Wis.
Continental Gin Co, 4500 Fifth Ave S, Birmingham, Ala.
Cullman Wheel Co, 1344 Altgeld St, Chicago, Ill.
Diamond Chain & Mfg Co, 444 Kentucky Ave, Indianapolis.
Gifford-Wood Co, 24 Hill St, Hudson, N. Y.
Jeffrey Mfg Co, 932-99 N 4th St, Columbus, Ohio.
Link-Belt Co, 220 S Belmont Ave, Indianapolis, Ind.
Adv page 3
McNally Pittsburg Mfg Co, Pittsburg, Kans.
Medart Co, 3548 DeKalb St, St. Louis, Mo.
Morse Chain Co, Ithaca, N. Y.
Adv page 26
Murray, D J, Mfg Co, Wausau, Wis.
Philadelphia Gear Works, Erie Ave & G St, Philadelphia, Pa.
Adv page 57
Ramsey Chain Co, Inc, 1010 Broadway, Albany, N. Y.
Robinson Mfg Co, Muncy, Pa.
Stephens-Adamson Mfg Co, 5 Ridgeway Ave, Aurora, Ill.
Adv page 175
Union Chain & Mfg Co, Sandusky, Ohio.
Watson-Flagg Machine Co, 833-863 E 25th St, Paterson, N. J.
Webster Mfg Inc, Tiffin, Ohio
Whitney Chain & Mfg Co, 237 Hamilton St, Hartford, Conn.

CHECK VALVES

(See Valves, Check)

CHEMICALS, FIRE-EXTINGUISHING

(See Extinguishing Chemicals, Fire)

CHEMICAL FEEDERS

(See Feeders, Chemical and Pumps, Proportioning)

CHILL RINGS

(See Rings, Chill)

CHILLERS, WATER, AIR CONDITIONING

Air & Refrigeration Corp, 475 Fifth Ave, New York, N. Y.
Howe Ice Machine Co, 2821 Montrose Ave, Chicago, Ill.
Richmond Engrg Co, 7th and Hospital Sts, Richmond, Va.
Stearns-Roger Mfg Co, Denver, Colo.
Trico Fuse Mfg Co, 2955 N 5th St, Milwaukee, Wis.
Vilter Mfg Co, 2217 S First St, Milwaukee, Wis.
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61
York Ice Mach Corp, York, Pa.

CHIMNEYS, BRICK, CONCRETE

(See Also Stacks)
American Chimney Corp, 147 4th Ave, New York, N. Y.
Boland, John V, Constr Co, 2715 Dalton Ave, St Louis, Mo.
Continental Chimney Co, 127 N Dearborn St, Chicago, Ill.
Custodis, Alphons, Chimney Construction Co, 80 Broad St, New York, N. Y.
Cutshall, J M, & Sons, Brazil, Ind.
Stearns-Roger Mfg Co, Denver, Colo.
Summerhays, Wm, Sons Corp, Rochester, N. Y.
Weber Chimney Co, 332 S Michigan Ave, Chicago, Ill.

CIRCUIT BREAKERS

(See Breakers, Circuit)

CLAMPS, PIPE

Band-It Co, 25-36 Walnut St, Denver, Colo.
Crane Co, 836 S Michigan Ave, Chicago, Ill.
Adv page 123
Diamond Expansion Bolt Co, Garwood, N. J.
Gaso Pump & Burner Mfg Co, Tulsa, Okla.
Jarecki Mfg Co, Erie, Pa.
Limbert, Geo B & Co, 570 Fulton St, Chicago, Ill.
Mueller Co, Decatur, Ill.
Smooth-On Mfg Co, D-30, 572 Communipaw, Jersey City, N. J.
Stearns-Roger Mfg Co, Denver, Colo.
Yarnall-Waring Co, Chestnut Hill, Philadelphia, Pa.
Adv page 109

CLARIFIERS, OIL

(See Purifiers, Oil)

B-H

HEAT INSULATION PRODUCTS

No. 1 INSULATING CEMENT

- Effective up to 1800° F.
- 100% Reclaimable up to 1200° F.

With Rust Inhibitor
Easy to Mix and Apply
Write for Catalog showing complete Line of Insulation Materials

A plastic insulation with exceptionally high insulating value and, strong adhesiveness which makes a secure bond with hot or cold surfaces. It has high coverage and because of its low volume shrinkage, it will not pull away at the joints. An ideal maintenance insulation. Contains rust inhibitor which prevents corrosion taking place between insulated surface and cement.

BALDWIN-HILL CO.
575 KLAGG AVE.
TRENTON, N. J.
Branch Offices: NEW YORK
KALAMAZOO, MICH.

AN IMPORTANT ANNOUNCEMENT TO ALL TUBE CLEANER BUYERS

Because it has become impossible for us to meet the ever increasing demand for Wilson Tube Cleaners and Wilson tube cleaning accessories in our plant at 47-28 37th Street, Long Island City, N. Y., we have purchased the building shown in the above photograph.

In our new home we will have available over three and one half times the floor space we had in our former plant. We have installed many new high speed machine tools and the greatly increased production capacity which these additional machines are giving us enable us to make more Wilson Tube Cleaners and accessories and also to make quicker shipments.

Write for the name of our representative nearest to you or ask for a copy of our NEW forty-page catalog which fully describes and illustrates the complete line of Wilson tube cleaning equipment.

INVEST IN AMERICA! BUY WAR BONDS AND STAMPS!

THOMAS C. WILSON, Inc.

PIPE AND TUBE CLEANERS EXCLUSIVELY

THE WILSON BUILDING

21-11 44TH AVE. LONG ISLAND CITY, N. Y.

CLEANERS, BOILER-TUBE

Adams, O H Co, 2018 East Thomas Ave, Milwaukee, Wis.
Airetool Mfg Co, 308 S Center St, Springfield, Ohio
Boiler Equipment Trust, North Amherst, Mass.
Brunt Equipment Co, 64 S Division St, Buffalo, N. Y.
Adv page 211
Elliott Co, Springfield, Ohio
Adv pages 4, 5, 187
Haering, D W, & Co, 205 W Wacker Drive, Chicago, Ill.
Huyette, Paul B, Co, 403 N Broad St, Philadelphia, Pa.
Adv page 144
Jarecki Mfg Co, Erie, Pa.
Oakite Products Inc, 23 Thames St, New York, N. Y.
Perfection Grate & Stoker Co, Springfield, Mass.
Pierce, Wm B, Co, Caxton Bldg, Buffalo, N. Y.
Pilley Brush Co, Fort Madison, Iowa
Roto Co, 145 Sussex Ave, Newark, N. J.
Adv page 165
Sexauer, J A, Mfg Co, 2503 Third Avenue, New York, N. Y.
Spencer Turbine Co, 488 New Park Ave, Hartford, Conn.
Water Treatment Co of America, 1159 Hodgkiss St, Pittsburgh, Pa.
Adv page 142
Wilson, Thomas C, Inc, 47-28 37th St, Long Island City, N. Y.
Adv page 210

CLEANERS, HEAT-EXCHANGER, TUBE

Airetool Mfg Co, 308 S Center St, Springfield, Ohio
Condenser Service & Engrg Co, 310 12th St, Hoboken, N. J.
Adv page 181
Elliott Co, Springfield, Ohio
Adv pages 4, 5, 187
Franklin Development Co, Drexel Bldg, Philadelphia, Pa.
Oakite Products Inc, 23 Thames St, New York, N. Y.
Robinson, John R, 354 W 31st St, New York, N. Y.
Roto Co, 145 Sussex Ave, Newark, N. J.
Adv page 165
Water Treatment Co of America, 1159 Hodgkiss St, Pittsburgh, Pa.
Adv page 142
Wilson, Thomas C, Inc, 47-28 37th St, Long Island City, N. Y.
Adv page 210

CLEANING SYSTEMS, VACUUM

Allen Billmyre Corp, Daily News Bldg, New York, N. Y.
Boiler Equipment Trust, North Amherst, Mass.
Brady Conveyors Corp, 20 W Jackson Blvd, Chicago, Ill.
Breuer Electric Mfg Co, 5100 N Ravenswood Ave, Chicago, Ill.
Holly Pneumatic Systems, Dept 15, 15 E 40th St, New York, N. Y.
National Super Service Co, 1946 N 13th St, Toledo, Ohio
Roots-Connersville Blower Corp, Connersville, Ind.
Spencer Turbine Co, 488 New Park Ave, Hartford, Conn.
Sturtevant, B F, Co, 47 Readville St, Boston, Mass.
Adv pages 40, 41
U. S. Hoffman Machinery Corp, 105 4th Ave, New York, N. Y.

CLOCKS, PROGRAM

(See Controllers, Time-Cycle)

CLOTH, ASBESTOS

(See Asbestos Products)

CLUTCHES, AUTOMATIC

American Clutch Equipment Co, Clifton, N. J.
Dawes Equipment, Inc, 2280 Penobscot Bldg, Detroit, Mich.
Diamond Iron Works Inc, Minneapolis, Minn.
Fast, Gustav, Engrg Co, Annapolis, Md.
Hilliard Corp, 4 W 4th St, Elmira, N. Y.
Madden, J P, Bethlehem, Pa.
Precision Development Co, College Ave, Salisbury, Md.
Washburn Shops, Worcester, Mass.

CLUTCHES, FRICTION

Brown Engineering Co, 119 E 3rd St, Reading, Pa.
Caldwell, W E, Co, Inc, 280 Brandeis St, Louisville, Ky.
Carlyle Johnson Machine Co, 52 Main Street, Manchester, Conn.
Chain Belt Co, 1674 W Bruce St, Milwaukee, Wis.
Chicago Pulley & Shafting Co, Chicago, Ill.
Conway Clutch Co, Cincinnati, O.
Dodge Mfg Corp, Mishawaka, Ind.
Falls Clutch & Machinery Co, Cuyahoga Falls, Ohio.
Foote Bros Gear & Machine Co, Western Blvd, Chicago, Ill.
Adv page 163
Hill Acme Co, 6400 Breakwater Ave, Cleveland, Ohio
Hilliard Corp, 4 W 4th St, Elmira, N. Y.
Jeffrey Mfg Co, 932-99 N 4th St, Columbus, Ohio
Johnson, Carlyle, Machine Co, 52½ Main St, Manchester, Conn.
Jones, W A, Foundry & Machine Co, 4423 W Roosevelt Rd, Chicago, Ill.
Kinney Mfg Co, 3529 Washington St, Boston, Mass.
Link-Belt Co, 300 W Pershing Road, Chicago, Ill.
Adv page 3
McMahon & Co, Worcester, Mass.
Medart Co, 3548 DeKalb St, St. Louis, Mo.
Moore & White Co, Philadelphia, Pa.
Morse Chain Co, Ithaca, N. Y.
Adv page 26
Murray, D J, Mfg Co, Wausau, Wis.
Precision Development Co, College Ave, Salisbury, Md.
Ramsey Chain Co, Inc, 1010 Broadway, Albany, N. Y.
Rockford Drilling Machine Div, Borg-Warner Corp, 114 Catherine St, Rockford, Ill.
St Regis Paper Co, Engrg & Mach Div, Mitchell St, Oswego, N. Y.
Spicer Mfg Corp, Toledo, Ohio.
Sprout, Waldron & Co, Muncy, Pa.
Stephens-Adamson Mfg Co, 5 Ridgeway Ave, Aurora, Ill.
Adv page 175
Twin Disc Clutch Co, Racine, Wis.
Watson-Flagg Machine Co, Paterson, N. J.
Weber Engine Co, 12th & Winchester Sts, Kansas City, Mo.
Webster Mfg, Inc, Tiffin, Ohio
Wood's, T B, Sons Co, 1165 5th Ave, Chambersburg, Pa.

CLUTCHES, MAGNETIC

Cutler-Hammer, Inc, 606 N 12th St, Milwaukee, Wis.
Adv page 107
Dings Magnetic Separator Co, Milwaukee, Wis.
Dynamic Corp, Kenosha, Wis.
Stearns Magnetic Mfg Co, 657 S 28th St, Milwaukee, Wis.
Universal Gear Corp, 1452 E 19th St, Indianapolis, Ind.

CLUTCHES, OVERRUNNING

Hilliard Corp, 4 W 4th St, Elmira, N. Y.
Morse Chain Co, Ithaca, N. Y.
Adv page 26
Precision Development Co, College Ave, Salisbury, Md.

CO_2 ANALYZERS

(See Analyzers, CO_2, Portable)

COAL

Appalachian Coals, Inc, Cincinnati, Ohio.
Berwind-White Coal Mining Co, 1 Broadway, New York, N. Y.
Chesapeake & Ohio Railway, Terminal Tower, Cleveland, Ohio.
Consolidation Coal Co, 30 Rockefeller Plaza, New York, N. Y.
General Coal Co, 123 South Broad St, Philadelphia
Adv page 174
Koppers Coal Co, Pittsburgh, Pa.
North American Coal Corp, Cleveland, Ohio
Peale, Peacock & Kerr, 420 Lexington Ave, New York, N. Y.
Pennsylvania Coal & Coke Corp, 70 E 45th St, New York.
Pittsburgh Coal Co, Pittsburgh, Pa.
Valley Camp Coal Co, Western Reserve Bldg, Cleveland, Ohio.

COAL CRUSHERS

(See Crushers, Coal)

COAL METERS

(See Meters, Coal)

COAL PULVERIZERS

(See Pulverizers, Coal)

COAL SAMPLERS

(See Samplers, Coal)

COAL STORAGE

(See Storage Systems, Coal)

COATINGS, BOILER-DRUM AND TUBE

Dampney Co of America, 1243 River St, Hyde Park, Mass.
Huyette, Paul B, Co, Inc, 403 N Broad St, Phila, Pa.
Adv page 144
Vita-Var Corp, Newark, N. J.

COATINGS, BOILER SETTING

Carey, Philip, Mfg Co, 6th and Main Sts, Cincinnati, Ohio
Adv page back cover
Ehret Magnesia Mfg Co, Valley Forge, Pa.
Adv page 157
Johns-Manville Corp, 22 East 40th St, New York, N. Y.
Adv pages 44, 45
Mexico Refractories Co, Mexico, Mo.
Plibrico Jointless Firebrick Co, 1818 Kingsbury St, Chicago, Ill.
Adv pages 205, 206, 255, 282
Tropical Paint & Oil Co, Cleveland, Ohio

COATINGS, HEAT-, CORROSION-RESISTANT

Acheson Colloids Corp, 3000 Washington Ave, Port Huron, Mich.
Brown, David C, Co, 17532 Wisconsin, Detroit, Mich.
Cheesman-Elliot Co, 647 Kent Ave, Brooklyn, New York
Dampney Co of America, 1243 River St, Hyde Park, Mass.
Haering, D W, & Co, 205 W Wacker Drive, Chicago, Ill.
Inertol Co, 470 Frelinghuysen Ave, Newark, N. J.
Metallizing Engrg Co, 21-07 41st St, Long Island City, N. Y.
Monsanto Chemical Co, St Louis, Mo.
Pennsylvania Salt Mfg Co, 1000 Widener Bldg, Phila, Pa.
Perolin Co of N. Y., 10 East 40th St, New York, N. Y.
Philadelphia Quartz Co, 121-24 S 3rd St, Philadelphia, Pa.
Quigley Co, 56 W 45th St, New York, N. Y.
Thurmalox Co, 3109 N Broad St, Philadelphia, Pa.
Vita-Var Corp, Newark, N. J.
Wailes Dove-Hermiston Corp, Westfield, N. J.

COILS, PIPE, TUBING

Alpha Metal & Rolling Mills Inc, 363 Hudson Ave, Brooklyn, N. Y.
American Brass Co, 25 Broadway, New York, N. Y.
Adv page 121
Anaconda Wire & Cable Co, 25 Broadway, New York, N. Y.
California Steel Products Co, Barrett & A Sts, Richmond, Calif.
Chase Brass & Copper, 236 Grand St, Waterbury, Conn.
Clow, James B, & Sons, 201-299 N Talman Ave, Chicago, Ill.
Corning Glass Works, Dept IP, Corning, N. Y.
Crane Co, 836 S Michigan Ave, Chicago, Ill.
Adv page 123
Duriron Co, Inc, Dayton, Ohio.
General Refrigeration Div, Yates-American Mach Co, Beloit, Wis.
Grinnell Co, 277 W Exchange St, Providence, R. I.
Adv page 156
Hamilton Copper & Brass Works, Hamilton, Ohio.
Harris, Arthur & Co, 212 N Aberdeen St, Chicago, Ill.
Harrisburg Steel Corp, Harrisburg, Pa.
Howe Ice Machine Co, 2821 Montrose Ave, Chicago, Ill.
Keating, E F, Pipe Bending Co, Inc, Hartford, Conn.
Kopperman, Jos & Sons, 312-16 New St, Philadelphia, Pa.
Limbert, Geo B, & Co, 570 Fulton St, Chicago, Ill.
Marlo Coil Co, St Louis, Mo.
Midwest Piping & Supply Co, 1450 S 2nd St, St Louis Mo.
Adv page 43
National Lead Co, 111 Broadway, New York, N. Y.
National Pipe Bending Co, New Haven, Conn.
National Valve & Mfg Co, 3102 Liberty Ave, Pittsburgh, Pa.
Adv page 200
Parker Appliance Co, 17325 Euclid Ave, Cleveland, Ohio.
Pittsburgh Pipe Coil & Bending Co, Pittsburgh, Pa.
Pittsburgh Piping & Equipt Co, 12 43rd St, Pittsburgh, Pa.
Adv page 179
Power Piping Div, Blaw-Knox Co, 1525 Pennsylvania Ave, Blawnox, Pa.
Adv pages 24, 25
Rempe Co, 340 N Sacramento Blvd, Chicago, Ill.
Rome-Turney Radiator Co, 200 Lynch St, Rome, N. Y.
Ross Heater & Mfg Co, Inc, 1409 West Ave, Buffalo, N. Y.
Shaw, B F, Co, 509 E 2nd St, Wilmington, Del.
Adv page 35
Stearns-Roger Mfg Co, Denver, Colo.
Sturtevant B F Co, 47 Readville St, Boston, Mass.
Adv pages 40, 41
Typhoon Air Conditioning Co, 252 West 26th St, New York.

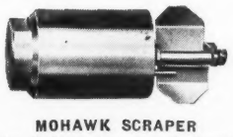
SAVE BY CLEANING

Removal of incrustation from boiler tubes always reduces fuel bills.

In fire tubes and water tubes a Vibratap Cleaner removes all scale.

Vibratory action dislodges the full thickness of the deposit and leaves the tubes really clean.

For removing soot and slag from fire tubes use a power-driven



MOHAWK SCRAPER

The Mohawk loosens all deposit and blows it out of the tube.

BRUNT EQUIPMENT CO.

60 S. Division St. Buffalo, N. Y.

Whitlock Mfg Co, 77 South St, Hartford, Conn.
Adv page 232
Wolverine Tube Div, Detroit, Mich.

COILS, REFRIGERATING

Baker Ice Machine Co, Inc, Omaha, Neb.
California Steel Products Co, Barrett & A Sts, Richmond, Calif.
Chase Brass & Copper, 236 Grand St, Waterbury, Conn.
Fedders Mfg Co, 63 Tonawanda St, Buffalo, N. Y.
Frick Co, Inc, 325 Broadway, Waynesboro, Pa.
Frigidaire Commercial & Air Cond Div, Dayton, Ohio
General Machy Co, Riverside Ave, Spokane, Wash.
General Refrigeration Div, Yates-American Machine Co, Beloit, Wis.
Harrisburg Steel Corp, Harrisburg, Pa.
Howe Ice Machine Co, 2821 Montrose Ave, Chicago, Ill.
Keating, E F, Pipe Bending Co, Inc, Hartford, Conn.
Kennard, Sam, Inc, 3333 Market St, St Louis, Mo.
McQuay, Inc, Minneapolis, Minn.
Marlo Coil Co, St Louis, Mo.
Midwest Piping & Supply Co, 1450 S 2nd St, St Louis Mo.
Adv page 43
Mueller Brass Co, 1925-A Lapeer Ave, Pt Huron, Mich.
National Pipe Bending Co, New Haven, Conn.
Niagara Blower Corp, 6 E 45th St, New York, N. Y.
Peerless of America, Inc, Marion, Ind.
Pittsburgh Pipe Coil & Bending Co, Pittsburgh, Pa.
Refrigeration Economics Co, 1323 Second St, NE, Canton, Ohio
Rempe Co, 340 N Sacramento Blvd, Chicago, Ill.
Rome-Turney Radiator Co, 200 Lynch St, Rome, N. Y.
Stearns-Roger Mfg Co, Denver, Colo.
Sturtevant, B F, Co, 47 Readville St, Boston, Mass.
Adv pages 40, 41
Trane Co, 2012 Cameron Ave, La Crosse, Wis.
Typhoon Air Conditioning Co, 252 W 26th St, New York, N. Y.
Vesterdahl, Karl, & Co, 90 West St, New York, N. Y.
Vilter Mfg. Co, 2217 S 1st St, Milwaukee, Wis.
Whitlock Mfg Co, 77 South St, Hartford, Conn.
Adv page 232
Wolverine Tube Co, Detroit, Mich.
Worthington Pump & Machinery Corp, Harrison, N. J.
Adv page 171
York Ice Machry Corp, York, Pa.

COLD-STORAGE PLANTS

Baker Ice Machine Co, Inc, Omaha, Neb.
Frick Co, Inc, 325 Broadway, Waynesboro, Pa.
Frigidaire Commercial & Air Cond Div, Dayton, Ohio
General Machinery Co, Spokane, Wash.
General Refrigeration Div, Yates-American Mach Co, Beloit, Wis.
Stearns-Roger Mfg Co, Denver, Colo.
Vilter Mfg Co, 2217 S 1st St, Milwaukee, Wis.
Adv page 174
Worthington Pump & Machinery Corp, Harrison, N. J.
Adv page 171
York Ice Machry Corp, York, Pa.

COLLECTORS, DUST

Aget-Detroit Mfg Co, 2040 Book Bldg, Detroit, Mich.
Allen Billmyre Corp, Daily News Bldg, New York, New York.
American Air Filter Co, Louisville, Ky.
American Blower Corp, 6000 Russell St, Detroit, Mich.
American Foundry Equipment Co, Mishawaka, Ind.
Bartlett & Snow, C O, Co, Cleveland, Ohio
Brady Conveyors Corp, 20 W Jackson Ave, Chicago, Ill.
Bubar, Hudson H, 15 Park Row, New York, N. Y.
Buell Engrg Co, 70 Pine St, New York, N. Y.
Buffalo Forge Co, 488 Broadway, Buffalo, N. Y.
Adv page 199
Diamond Power Specialty Corp, Box 288, Detroit, Mich.
Adv pages 116, 117
Dracco Corp, 4083 E 116th St, Cleveland, Ohio.
Engineering Specialties Co, 39 Cortlandt St, New York, N. Y.
Flyash Arrester Corp, Birmingham, Ala.
Garden City Fan Co, 332 S Michigan Ave, Chicago, Ill.
Grand Rapids Blow Pipe & Dust Arrester Co, Grand Rapids, Mich.
Holly Pneumatic Systems, Inc. Dept 15, 15 E 40th St, New York, N. Y.
Kirk & Blum Mfg Co, 2831 Spring Grove Ave, Cincinnati, Ohio.
McNally Pittsburg Mfg Co, Pittsburg, Kans.
Pangborn Corp, 90 Pangborn Blvd, Hagerstown, Md.
Peabody Engrg Corp, 580 5th Ave, New York, N. Y.
Adv page 153
Pease, Anthony, Equipt Co, 30 Charles River Rd, Cambridge, Mass.
Prat-Daniel Corp, 80 S Water St, Port Chester, N. Y.
Adv pages 212, 262
Savage, W J, Co, Knoxville, Tenn.
Skinner Heating & Ventilating Co, 1990 N 9th, St. Louis, Mo.
Sly, W W, Mfg Co, Cleveland, O.
Spencer Turbine Co, 488 New Park Ave, Hartford, Conn.
Staynew Filter Corp, Rochester, N. Y.
Sterling Blower Co, 791 Windsor St, Hartford, Conn.
Sturtevant, B F Co, 47 Readville St, Boston, Mass.
Adv pages 40, 41
Tabor Mfg Co, Tacony St, Philadelphia, Pa.
U S Hoffman Machy Corp, 105 4th Ave, New York, N. Y.
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61

COLLECTORS, FLYASH

American Blower Corp, 6000 Russell St, Detroit, Mich.
Research Corp, 405 Lexington Ave, New York, N. Y.
Bubar, Hudson H, 15 Park Row, New York, N. Y.
Buell Engrg Co, Inc, 70 Pine St, New York, N. Y.
Flyash Arrester Corp, Birmingham, Ala.
Green Fuel Economizer Co, 637 Main St, Beacon, N. Y.
Prat-Daniel Corp, 80 S Water St, Port Chester, N. Y.
Adv pages 212, 262
Riley Stoker Corp, 999 Neponset St, Worcester, Mass.
Adv pages 96, 97
Sturtevant, B F Co, 47 Readville St, Boston, Mass.
Adv pages 40, 41
Western Precipitation Corp, 1016 W 9th, Los Angeles, Cal.

COLUMNS, WATER

(See Water Columns)

COMBUSTION CONTROL

(See Control Systems, Combustion)

COMMUTATOR DRESSERS

(See Dressers, Commutators)

COMPOUNDS, CONCRETE, RESURFACING

Feedwaters Inc, 140 Cedar St, New York, N. Y.
Flexrock Co, 23rd & Manning Sts, Philadelphia, Pa.
Stonhard Co, Terminal Commerce Bldg, Philadelphia, Pa.
Truscon Laboratories, Detroit, Mich.

COMPOUNDS, GREASE-REMOVING

Adams, O H, Co, 2018 East Thomas Ave, Milwaukee, Wis.
Barrett Co, 40 Rector St, New York, N. Y.
Detroit Rex Products Co, Hillview & Sorrento Aves, Detroit, Mich.
du Pont de Nemours, E I, & Co, Wilmington, Del.
Madden, P E, & Co, 352 W Walton St, Chicago, Ill.
Oakite Products Inc, 23 Thames St, New York, N. Y.
Pennsylvania Salt Mfg Co, 1000 Widener Bldg, Philadelphia, Pa.
Philadelphia Quartz Co, 121-124 S 3rd St, Philadelphia, Pa.
Plouff Co, 1151 Columbus Ave, Boston, Mass.
Quigley Co, 56 W 45th St, New York, N. Y.
Standard Oil of Calif, 225 Bush St, San Francisco, Calif.

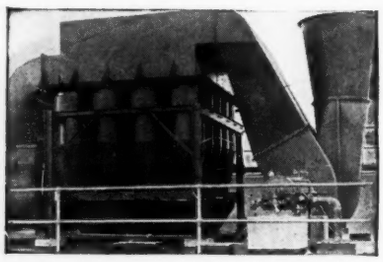
COMPOUNDS, PIPE-JOINT

Acheson Colloids Corp, 3000 Washington Ave, Pt Huron Mich.
Chard & Howe, 56-64 Nurge Ave, Maspeth, N. Y.
Crane Co, 836 S Michigan Ave, Chicago, Ill.
Adv page 123
Crane Packing Co, 1801 Cuyler Ave, Chicago, Ill.
Dixon, Joseph, Crucible Co, 170 Wayne St, Jersey City, N. J.
Adv page 186
Garlock Packing Co, 400 Main St, Palmyra, N. Y.
Adv page 42
Grinnell Co, Inc, 277 W Exchange St, Providence, R. I.
Adv page 156
Ilsley, Doubleday & Co, 56-14 Nurge Ave, Maspeth, N. Y.
Key Co, Alta Sita, East St Louis, Ill.
Keystone Lubricating Co, Clearfield & Lippincott Sts, Philadelphia, Pa.
National Engineering Products, Inc, Commerce & Savings Bldg, Washington, D. C.
Plouff Co, 1151 Columbus Ave, Boston, Mass.
Preferred Utilities Mfg Corp, New York, N. Y.
Quigley Co, 56 W 45th St, New York, N. Y.
Rockwood Sprinkler Co, 54 Harlow St, Worcester, Mass.
Sexauer, J A, Mfg Co, 2503 Third Avenue, New York, N. Y.
Smooth-On Mfg Co, D-30, 572 Communipaw Ave, Jersey City, N. J.
So-Lo Works, 3317 Madison Rd, Cincinnati, Ohio
Standard Oil Co, Ind., 910 S Michigan Ave, Chicago, Ill.
U. S. Graphite Co, Holland Ave, Saginaw, Mich.
X Laboratories, 26 W 45th St, New York, N. Y.
X-Pando Corp, 43–15 36th St, Long Island City, N. Y.

COMPOUNDS, RUST-PREVENTING

Adkins, Young & Allen Co, S Jefferson St, Chicago, Ill.
American Sand-Banum Co, Dept MP, 9 Rockefeller Plaza, New York, N. Y.
Barrett Co, 40 Rector St, New York, N. Y.
Brown, David C, Co, 17532 Wisconsin, Detroit, Mich.
Chemical Solvent Co, Box 487, Birmingham, Ala.
Dampney Co of America, 1243 River St, Hyde Park, Mass.
Dearborn Chemical Co, 310 South Michigan Ave, Chicago, Ill.
Detroit Rex Products Co, Hillview & Sorrento Aves, Detroit, Mich.
Feedwaters Inc, 140 Cedar St, New York, N. Y.
Flintkote Co, 30 Rockefeller Plaza, New York, N. Y.
Franklin Oil & Gas Co, Bedford, Ohio
Haering, D W, & Co, 205 W Wacker Drive, Chicago, Ill.
Houghton, E F, & Co, 244–50 W Somerset St, Philadelphia, Pa.
Inertol Co, Inc, 470 Frelinghuysen Ave, Newark, N. J.

The Pride of Craftsmanship



Back of every Thermix Dust Collector there is more than mere routine "good workmanship". The pride, as well as the skill, of many veterans goes into them.

And therein lies the secret of the reputation of Thermix Dust Collectors.

Down the line, right to the assembly room, every man realizes that he is carrying out the tradition of an institution of which he is proud.

Whenever Dust Collectors are required for the War Effort, or will be required for the reconstruction period, this loyalty and high ideals on the part of the engineers and the men and women who make this organization, is one of the greatest assurances of maintaining the name Thermix and Prat-Daniel in the forefront of their field.

Write for catalogs.

PRAT-DANIEL CORPORATION, Port Chester, N Y.

General Sales Agents

Thermix Engineering Co., Greenwich, Conn.

Representatives in Principal Cities

Keystone Lubricating Co, Clearfield & Lippincott Sts, Philadelphia, Pa.
Madden, P E, & Co, 352 W Walton St, Chicago, Ill.
Monsanto Chemical Co, St. Louis, Mo.
North American Fibre Products Co, Cleveland, Ohio
Oakite Products Inc, 23 Thames St, New York, N. Y.
Perolin Co of N. Y., 10 East 40th St, New York, N. Y.
Philadelphia Quartz Co, 121 S 3rd St, Philadelphia, Pa.
Rustvoid Products Inc, 9 Murray St, New York, N. Y.
Socony - Vacuum Oil Co, 26 Broadway, New York, N. Y.
So-Lo Works, 3317 Madison Rd, Cincinnati, Ohio
Standard Oil Co, Ind., 910 S Michigan Ave, Chicago, Ill.
Standard Oil Co, of N. J., 26 Broadway, New York, N. Y.
Stonhard Co, Terminal Commerce Bldg, Philadelphia, Pa.
X Laboratories, 26 W 45th St, New York, N. Y.
Wailes Dove-Hermiston Corp, Westfield, N. J.
Western Chemical Co, 714 Washington, Kansas City, Mo.

COMPOUNDS, SCALE-, RUST-REMOVING

American Sand-Banum Co, Dept MP, 9 Rockefeller Plaza, New York, N. Y.
Bird-Archer Co, 400 Madison Ave, New York, N. Y.
Adv pages 225, 238, 282, 283
Buromin Co, Hagan Bldg, Pittsburgh, Pa.
Chemical Solvent Co, Box 487, Birmingham, Ala.
Dearborn Chemical Co, 310 South Michigan Ave, Chicago, Ill.
Elgin Softener Corp, 130 N Grove Ave, Elgin, Ill.
Adv page 283
Feedwaters, Inc, 140 Cedar St, New York, N. Y.
Haering, D W, & Co, 205 W Wacker Drive, Chicago, Ill.
Madden, P E, & Co, 352 W Walton St, Chicago, Ill.
McVicker, W B, Co, Douglass St, Brooklyn, N. Y.
North American Fibre Prod Co, Cleveland, Ohio
Oakite Products, Inc, 23 Thames St, New York, N. Y.
Permutit Co, Dept A, 330 W 42nd St, New York, N. Y.
Adv pages 152, 159
Perolin Co of N. Y., 10 E 40th St, New York, N. Y.
Plouff Co, 1151 Columbus Ave, Boston, Mass.
Rustvoid Products Inc, 9 Murray St, New York, N. Y.
Sexauer, J A, Mfg Co, 2503 Third Avenue, New York, N. Y.
X Laboratories, 26 W 45th St, New York, N. Y.
Thurmalox Co, 3109 N Broad St, Philadelphia, Pa.
Water Treatment Co of America, 1159 Hodgkiss St, Pittsburgh, Pa.
Adv page 142
Western Chemical Co, 714 Washington, Kansas City, Mo.

COMPOUNDS, SLUSHING

Borne-Scrymser Co, 632 S Front St, Elizabeth, N. J.
Franklin Oil & Gas Co, Bedford, Ohio
Harris, A W, Oil Co, Box 1295, Providence, R. I.
Houghton, E F, & Co, 244-50 W Somerset St, Philadelphia, Pa.
Ilsley, Doubleday & Co, 56-14 Nurge Ave, Maspeth, N. Y.
Ironsides Co, Columbus, Ohio.
Plouff Co, 1151 Columbus Ave, Boston, Mass.
Socony - Vacuum Oil Co, 26 Broadway, New York, N. Y.
So-Lo Works, 3317 Madison Rd, Cincinnati, Ohio
Standard Oil Co, Ind., 910 S Michigan Ave, Chicago, Ill.
Swan-Finch Oil Corp, RCA Bldg West, New York, N. Y.
Warren Bros Roads Co, Cambridge, Mass.

COMPOUNDS, WATERPROOFING

Baldwin-Hill Co, 575 Klagg Ave, Trenton, N. J.
Adv pages 204, 209, 238
Barrett Co, 40 Rector St, New York, N. Y.
Dearborn Chemical Co, 310 S Michigan Ave, Chicago, Ill.
du Pont de Nemours, E I, & Co, Wilmington, Del.
Flexrock Co, 23rd & Manning St, Philadelphia, Pa.
Flintkote Co, 30 Rockefeller Plaza, New York, N. Y.
Halowax Co, 30 East 42nd St, New York, N. Y.
Inertol Co, 470 Frelinghuysen Ave, Newark, N. J.
Johns-Manville, 22 E 40th St, New York, N. Y.
Adv pages 44, 45
Koppers Co, Pittsburgh, Pa.
North American Fibre Products Co, Cleveland, Ohio
Perolin Co of N. Y., 10 E 40th St, New York, N. Y.
Smooth-On Mfg Co, D-30, 572 Communipaw Ave, Jersey City, N. J.
Socony - Vacuum Oil Co, 26 Broadway, New York, N. Y.
So-Lo Works, 3317 Madison Rd, Cincinnati, Ohio
Sonneborn, L, Sons, Inc, 88 Lexington Ave, New York, N. Y.
Standard Oil of Calif, 225 Bush St, San Francisco, Calif.
Stonhard Co, Terminal Commerce Bldg, Philadelphia, Pa.
Toch Bros, Inc, 2600 Richmond Terrace, Staten Island, N. Y.
Tropical Paint & Oil Co, Cleveland, Ohio.
Truscon Labs, Detroit, Mich.
Vita-Var Corp, Newark, N. J.
Wailes Dove-Hermiston Corp, Westfield, N. J.

COMPRESSOR VALVES

(See Valves, Pump & Compressor)

COMPRESSORS, AIR, ENGINE STARTING

American Brake Shoe & Foundry, Kellogg Div, Rochester, N. Y.
Cooper-Bessemer Corp, Mt Vernon, Ohio
Ingersoll-Rand Co, 11 Broadway, New York, N. Y.
Adv pages 168, 169
Kahlenberg Brothers Co, Two Rivers, Wis.
Novo Engine Co, 1 Porter St, Lansing, Mich.
Quincy Compressor Co, Quincy, Ill.
Schramm, Inc, West Chester, Pa.
Sullivan Machinery Co, Michigan City, Ind.
Yeomans Bros Co, 1446 N Dayton St, Chicago, Ill.

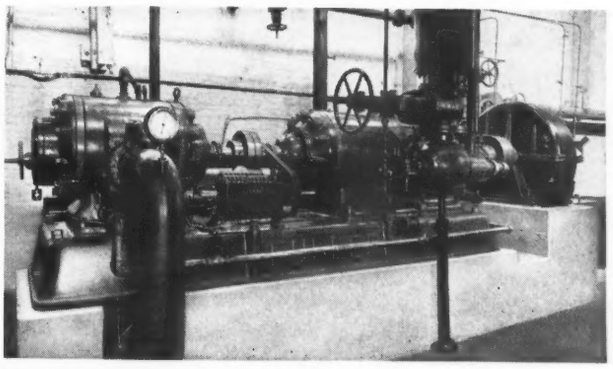
COMPRESSORS, AIR, GAS

Allen Billmyre Corp, Daily News Bldg, New York, N. Y.
Allis-Chalmers Mfg Co, Milwaukee, Wis.
Adv pages 6, 7
American Brake Shoe & Foundry, Kellogg Div, Rochester, N. Y.
American-Marsh Pumps, Inc, 60 Capitol Ave, N E, Battle Creek, Mich.
Beach-Russ Co, 50 Church St, New York, N. Y.
Brunner Mfg Co, 1821 Broad St, Utica, N. Y.
Bury Compressor Co, Erie, Pa.
Chicago Pneumatic Tool Co, 6-8 E 44th St, New York, N. Y.
Clark Bros Co, Olean, N. Y.
Cooper-Bessemer Corp, Mount Vernon, Ohio.
Crowell Mfg Co, 319 Franklin Ave, Brooklyn, N. Y.
Curtis Pneumatic Machinery Co, 1934 Kien Ave, St Louis, Mo.
De Vilbiss Co, Toledo, Ohio
De Laval Steam Turbine Co, Trenton, N. J.
Adv page 58
Elliott Co, Jeannette, Pa.
Adv pages 4, 5, 187
Fuller Co, 111 Bridge St, Catasauqua, Pa.
Adv pages 213, 253
Gardner-Denver Co, 100 Gardner Drive, Quincy, Ill.
Hardie-Tynes Mfg Co, Birmingham, Ala.
Hobart Bros Co, Troy, Ohio.
Ingersoll-Rand Co, 11 Broadway, New York, N. Y.
Adv pages 168, 169

FULLER ROTARY COMPRESSORS

for

ECONOMICAL AIR AND GAS COMPRESSION



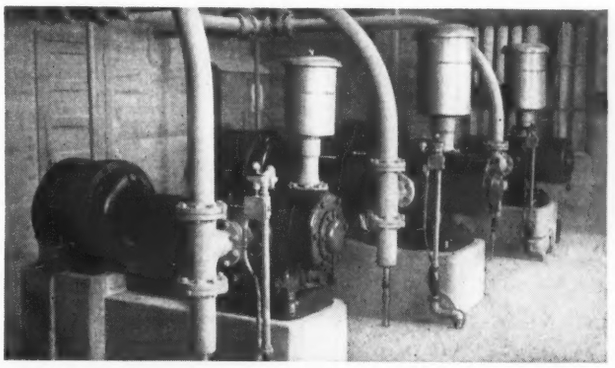
Two-stage compressor, geared-turbine drive. Capacity 1775 c.f.m., 100-lb. pressure.

For many years Fuller engineers have striven to build the best compressor money could buy . . . simple in design, rugged construction for long, continuous service at minimum operating expense.

Performance records show they're truly the economical unit . . . in a foundry $3.90 for repairs in three years; in a patent fastener plant after four years' operation: "It has run 23 hours per day almost continuously and has given no trouble." Not a cent was spent for repairs during this time.

FULLERS are built for capacities to 1800 c.f.m. actual free-air delivery, 125-lb. pressure.

Write for Bulletin C-5, illustrating and describing these machines.



Single-stage compressors. Two units, capacity each 763 c.f.m., 30-lb. pressure. One unit, capacity 320 c.f.m., 50-lb. pressure.

C-79

FULLER COMPANY
CATASAUQUA, PENNSYLVANIA
Chicago: 1144 Marquette Bldg.
San Francisco: 421 Chancery Bldg.

Kraissl Co, Hackensack, N. J.
Lammert & Mann Co, 215-21 North Wood Street, Chicago, Ill.
Le Roi Co, Milwaukee, Wis.
Mesta Machine Co, P O Box 1466, Pittsburgh, Pa.
Nash Engrg Co, S Norwalk, Conn.
National Steam Pump Co, Upper Sandusky, Ohio.
National Transit Pump & Machine Co, Oil City, Pa.
Nordberg Mfg Co, 3703 S Chase Ave, Milwaukee, Wis.
Norwalk Co, S Norwalk, Conn.
O K Clutch & Machinery Co, Columbia, Pa.
Oliver United Filters, Inc, Oakland, Calif.
Pennsylvania Pump & Compressor Co, Easton, Pa.
Quincy Compressor Co, Quincy, Ill.
Roots-Connersville Blower Corp, Connersville, Ind.
Schramm, Inc, West Chester, Pa.
Spencer Turbine Co, 488 New Park Ave, Hartford, Conn.
Sturtevant, B F Co, 47 Readville St, Boston, Mass.
Adv pages 40, 41
Sullivan Machinery Co, Michigan City, Ind.
Westinghouse Air Brake Co, Wilmerding, Pa.
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61
Worthington Pump and Machinery Corp, Harrison, N. J.
Adv page 171
Yeomans Bros Co, 1446 Dayton St, Chicago, Ill.
York Ice Machy Corp, York, Pa.

COMPRESSORS, REFRIGERATION

Baker Ice Machine Co, Inc, Omaha, Neb.
Brunner Mfg Co, 1821 Broad St, Utica, N. Y.
Carrier Corp, Syracuse, N. Y.
Clark Bros Co, Olean, N. Y.
Cooper-Bessemer Corp, Mt. Vernon, Ohio
Curtis Pneumatic Machinery Co, 1934 Kien Ave, St. Louis, Mo.
Curtis Refrigerating Machine Co, St. Louis, Mo.
Frick Co, Inc, 325 Broadway, Waynesboro, Pa.
Frigidaire Commercial & Air Cond Div, Dayton, Ohio
General Machinery Co, Riverside Ave, Spokane, Wash.
General Refrigeration Div, Yates-American Mach, Beloit, Wis.
Howe Ice Machine Co, 2821 Montrose Ave, Chicago, Ill.
Ingersoll-Rand Co, 11 Broadway, New York, N. Y.
Adv pages 168, 169
Trane Co, 2012 Cameron Ave, La Crosse, Wis.
Vesterdahl, Karl, & Co, 90 West St, New York, N. Y.
Vilter Mfg Co, 2217 S 1st St, Milwaukee, Wis.
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61
Worthington Pump and Machinery Corp, Harrison, N. J.
Adv page 171
Yeomans Bros Co, 1466 N Dayton St, Chicago, Ill.
York Ice Machy Corp, York, Pa.

CONDENSER REPAIRS

(See Repair Work, Condenser)

CONDENSER TUBES

(See Tubes, Condenser)

CONDENSERS, EVAPORATIVE

American Locomotive Corp, 30 Church St, New York, N. Y.
Adv pages 56, 155
Baker Ice Machine Co, Inc, Omaha, Neb.
Buffalo Forge Co, 488 Broadway, Buffalo, N. Y.
Adv page 199
Carrier Corp, Syracuse, N. Y.
Corning Glass Works, Dept IP, Corning, N. Y.
Curtis Refrigerating Machine Co, St. Louis, Mo.
Fairbanks, Morse & Co, 600 S Michigan Ave, Chicago, Ill.
Frick Co, 325 Broadway, Waynesboro, Pa.
General Refrigeration Div, Yates-American Mach Co, Beloit, Wis.
McQuay, Inc, Minneapolis, Minn.
Marlo Coil Co, St. Louis, Mo.
New England Cooling Tower Co, 32 Cambridge St, Charlestown, Mass.
Niagara Blower Co, 6 E 45th St, New York, N. Y.
Rome Turney Radiator Co, 200 Lynch St, Rome, N. Y.
Trane Co, 2012 Cameron Ave, La Crosse, Wis.
Vilter Mfg Co, 2217 S First St, Milwaukee, Wis.
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61
Worthington Pump & Machinery Corp, Harrison, N. J.
Adv page 171
York Ice Machy Corp, York, Pa.

CONDENSERS, JET, BAROMETRIC

Allis-Chalmers Mfg Co, Milwaukee, Wis.
Adv pages 6, 7
American Locomotive Corp, 30 Church St, New York, N. Y.
Adv pages 56, 155
Chicago Pneumatic Tool Co, 6-8 E 44th Street, New York, N. Y.
Croll-Reynolds Engrg Co, 17 John St, New York, N. Y.
Adv pages 222, 239
Dean Brothers Co, Indianapolis, Ind.
Elliott Co, Jeannette, Pa.
Adv pages 4, 5, 187
Foster Wheeler Corp, 165 Broadway, New York, N. Y.
Adv pages 38, 39
Ingersoll-Rand Co, 11 Broadway, New York, N. Y.
Adv pages 168, 169
Ross Heater & Mfg Co, 1407 West Ave, Buffalo, N. Y.
Schubert-Christy Corp, 1600 Georgia St, Affton Station, St. Louis, Mo.
Schutte & Koerting Co, 12th & Thompson Sts, Phila, Pa.
Struthers-Wells Corp, Warren, Pa.
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61
Wheeler, C H, Mfg Co, Lehigh & Sedgley Aves, Phila, Pa.

CONDENSERS, REFRIGERATION

(See also Refrigerating Systems)
Alberger Heater Co, 287 Chicago St, Buffalo, N. Y.
Alco Products Div, 36 Church St, New York, N. Y.
Adv pages 56, 155
Andale Co, 1600 Arch St, Philadelphia, Pa.
Baker Ice Machine Co, Inc, Omaha, Neb.
Brunner Mfg Co, 1821 Broad St, Utica, N. Y.
Carrier Corp, Syracuse, N. Y.
Curtis Pneumatic Machinery Co, 1934 Kien Ave, St Louis, Mo.
Fedders Mfg Co, 63 Tonawanda St, Buffalo, N. Y.
Frick Co, 325 Broadway, Waynesboro, Pa.
Frigidaire Commercial & Air Cond Div, Dayton, Ohio
General Machinery Co, Riverside Ave, Spokane, Wash.
General Refrigeration Div, Yates-American Machine Co, Beloit, Wis.
Howe Ice Machine Co, 2821 Montrose Ave, Chicago, Ill.
Ingersoll-Rand Co, 11 Broadway, New York, N. Y.
Adv pages 168, 169
Lummus Co, 420 Lexington Ave, New York, N. Y.
Adv page 192
McCord Radiator & Mfg Co, Detroit, Mich.
Rempe Co, 340 N Sacramento Blvd, Chicago, Ill.
Richmond Engrg Co, 7th & Hospital Sts, Richmond, Va.
Rome-Turney Radiator Co, 200 Lynch St, Rome, N. Y.
Stearns-Roger Mfg Co, Denver, Colo.
Struthers-Wells Titusville Corp, Warren Pa.
Trane Co, 2012 Cameron Ave, La Crosse, Wis.
Vilter Mfg Co, 2217 S 1st St, Milwaukee, Wis.
Vogt, Henry, Machine Co, 1000 W Ormsby St, Louisville, Ky.
Adv page 46
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61
Worthington Pump and Machinery Corp, Harrison, N. J.
Adv page 171
York Ice Machinery Corp, York, Pa.

CONDENSERS, SURFACE

Alberger Heater Co, 287 Chicago St, Buffalo, N. Y.
Allis-Chalmers Mfg Co, Milwaukee, Wis.
Adv pages 6, 7
American Locomotive Co, 30 Church St, New York, N. Y.
Adv pages 42, 172
Braun, C F, & Co, 1000 S Fremont Ave, Alhambra, Calif.
Condenser Service & Engrg Co, 310 12th St, Hoboken, N. J.
Adv page 181
Croll-Reynolds Engrg Co, 17 John St, New York, N. Y.
Adv pages 222, 239
Elliott Co, Jeannette, Pa.
Adv pages 4, 5, 187
Foster Wheeler Corp, 165 Broadway, New York, N. Y.
Adv pages 38, 39
Ingersoll-Rand Co, 11 Broadway, New York, N. Y.
Adv pages 168, 169
Ross Heater & Mfg Co, Inc, 1409 West Ave, Buffalo, N. Y.
Schubert-Christy Corp, 1600 Georgia St, St. Louis, Mo.
Stearns-Roger Mfg Co, Denver, Colo.
Struthers-Wells Corp, Warren, Pa.
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61
Wheeler, C H, Mfg Co, Lehigh & Sedgley Aves, Phila, Pa.
Worthington Pump & Machinery Corp, Harrison, N. J.
Adv page 171
Zallea Bros & Johnson, 820 Locust St, Wilmington, Del.

CONDUITS

ONE ITEM OF THE GRAYBAR 60,000

Clay—Fibre—Flexible and Rigid Steel. Heavywall and Thinwall. All types of fitting and conduit tools.

DISTRIBUTED BY

GraybaR ELECTRIC COMPANY

IN OVER 80 PRINCIPAL CITIES

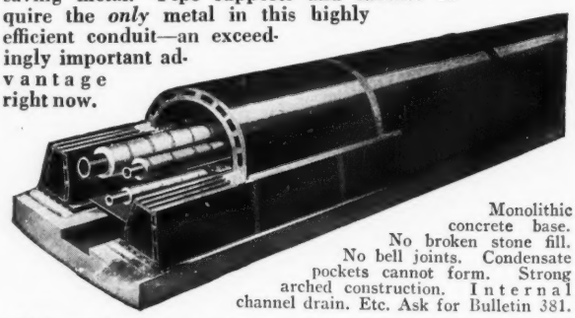
? Why waste metal needlessly? The amount of metal in ?

THERM-O-TILE

Reg. U. S. Pat. Off.

Underground Conduit is Practically Nil.

When you specify Therm-O-Tile you get not only the simplest, strongest, and most complete underground pipe conduit obtainable, but you HELP WIN THE WAR by saving metal. Pipe supports and saddles require the *only* metal in this highly efficient conduit—an exceedingly important advantage right now.



Monolithic concrete base. No broken stone fill. No bell joints. Condensate pockets cannot form. Strong arched construction. Internal channel drain. Etc. Ask for Bulletin 381.

Sold and installed by Johns-Manville Construction Units in all Principal Cities. See our page in Sweet's or The Heating Guide.

H. W. PORTER & CO., Inc.

827-P Frelinghuysen Ave., Newark, New Jersey

Without obligating us in any way. ☐ Please send Bulletin 381. ☐ Send representative. ☐ Enclosed is a sketch, with principal data of a prospective job, on which we shall be glad to have your ☐ comments, ☐ quotations.

Write your name, firm, and address on the margin of this page, tear out with the checked squares above, mail, and you will hear from us promptly.

CONDUIT-BENDING MACHINES

(See Pipe-Bending Machines)

CONDUIT, ELECTRICAL

American Brass Co, 25 Broadway, New York, N. Y.
Adv page 121
American Metal Hose Branch, Waterbury, Conn.
Anaconda Wire & Cable Co, 25 Broadway, New York, N. Y.
Byers, A M, Co, Pittsburgh, Pa.
Adv page 62
Chase Brass & Copper, 236 Grand St, Waterbury, Conn.
Clayton Mark & Co, 1900 Dempster St, Evanston, Ill.
General Electric Co, Schenectady, N. Y.
Adv pages 32, 33
Graybar Electric Co, 420 Lexington Ave, New York, N. Y.
Adv pages 214, 234, 243, 261, 265, 282, 284
Johns-Manville, 22 E 40th St, New York, N. Y.
Adv pages 44, 45
National Electric Products Corp, Pittsburgh, Pa.
Steel & Tubes Div, Republic Steel Corp, 218 E 131st St, Cleveland, Ohio.
Youngstown Sheet & Tube Co, Youngstown, Ohio.
Adv page 189

CONDUIT, STEAM, UNDERGROUND

American District Steam Co, 70 Bryant St, N Tonawanda, N. Y.
Adv page 160
Byers, A M, Co, Pittsburgh, Pa.
Adv page 62
Ehret Magnesia Mfg. Co, Inc, Valley Forge, Pa.
Adv page 157
Johns-Manville, 22 E 40th St, New York, N. Y.
Adv pages 44, 45
Porter, H W, & Co, 825 Frelinghuysen Ave, Newark, N. J.
Adv page 214
Ric-wiL Co, 1563 Union Commerce Bldg, Cleveland, Ohio
Adv page 193

CONDUIT, WOOD

American District Steam Co, 70 Bryant St, N Tonawanda, N. Y.
Adv page 160
Atlantic Creosoting Co, Inc, 17 Battery Place, New York, N. Y.

CONTROLS, SAFETY, GAS & OIL ENGINE

Bardco Mfg & Sales Co, 3725 Wilshire Blvd, Los Angeles, Cal.
Edison, Thomas A, Inc, West Orange, N. J.
Foxboro Co, 38 Neponset Ave, Foxboro, Mass.
General Controls Co, 810 Allen Ave, Glendale, Calif.
Penn Electric Switch Co, Goshen, Ind.

CONTROL SYSTEMS, AUTOMATIC, OIL & GAS ENGINE

Barber Colman Co, Rockford, Ill.
Bardco Mfg & Sales Co, 3725 Wilshire Blvd, Los Angeles, Cal.
Cooper-Bessemer Corp, Mt. Vernon, Ohio
Foxboro Co, 38 Neponset Ave, Foxboro, Mass.
Sarco Co, 475 5th Ave, New York, N. Y.

CONTROL SYSTEMS, AIR CONDITIONING

Armstrong Heat Control Co, Portland, Ore.
Barber Colman Co, Rockford, Ill.
Bristol Co, Waterbury, Conn.
Edison, Thomas A, Inc, West Orange, N. J.
Foxboro Co, 38 Neponset Ave, Foxboro, Mass.
General Controls Co, 810 Allen Ave, Glendale, Calif.
Johnson Service Co, 507 E Michigan St, Milwaukee, Wis.
Mason-Neilan Regulator Co, 1186 Adams St, Boston, Mass.
Mercoid Corp, 4229 Belmont Ave, Chicago, Ill.
Minneapolis-Honeywell Regulator Co, Minneapolis, Minn.
Parks-Cramer Co, Fitchburg, Mass.
Photoswitch, Inc, 21 Chestnut St, Cambridge, Mass.
Sarco Co, 475 5th Ave, New York, N. Y.
Taylor Instrument Cos, 95 Ames St, Rochester, N. Y.
Vapor Car Heating Co, 80 E Jackson Blvd, Chicago, Ill.
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61
York Ice Machy Corp, York, Pa.

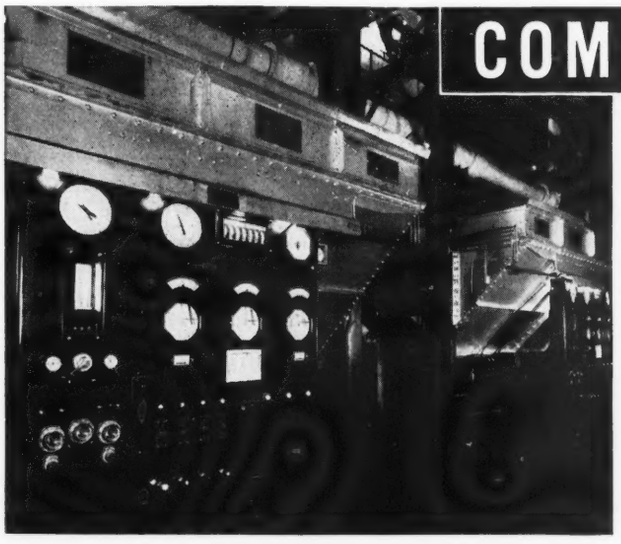
Look for the noun in the product listing, for example:
"Conduit, Electrical"
not
"Electrical Conduit"

CONTROL SYSTEMS, COMBUSTION

Askania Regulator Co, S Michigan Ave, Chicago, Ill.
Bailey Meter Co, 1036 Ivanhoe Rd, Cleveland, Ohio.
Adv pages 14, 15
Bristol Co, Waterbury, Conn.
Brooke Engineering Co, 517 Wayne Ave, Philadelphia, Pa.
Brown Instrument Co, 4490 Wayne Ave, Philadelphia, Pa.
Adv pages 51, 240, 254, 258, 266
Cash, A W, Co, Decatur, Ill.
Defender Automatic Regulator Co, St. Louis, Mo.
Engineer Co, 75 West St, New York, N. Y.
Adv page 185
Foxboro Co, 38 Neponset Ave, Foxboro, Mass.
General Controls Inc, 810 Allen Ave, Glendale, Calif.
General Power Plant Corp, 512 Fifth Ave, New York, N. Y.
General Regulator Corp, 165 Broadway, New York, N. Y.
Adv page 127
Hagan Corp, Hagan Bldg, Pittsburgh, Pa.
Adv pages 30, 31
Hays Corp, 905 8th St, Michigan City, Ind.
Adv pages 202, 216, 227, 254
Hotstream Heater Co, 8007 Grand Ave, Cleveland, Ohio
Illinois Engrg Co, Racine Ave & 21st St, Chicago, Ill.
Johnson Service Co, 507 E Michigan Ave, Milwaukee, Wis.
Leeds & Northrup Co, 4970 Stenton Ave, Philadelphia, Pa.
Adv page 2d cover
Minneapolis-Honeywell Regulator Co, 2747 4th Ave S, Minneapolis, Minn.
Republic Flow Meters Co, 2222 Diversey Pkwy, Chicago, Ill.
Adv pages 215, 221, 241, 280
Shallcross Controls, Inc, 121 N Broadway, Milwaukee, Wis.
Tejax Engrg Corp, 2 Allens Ave, Providence, R. I.
Adv page 237
Weeks Merit System, Inc, 228 Aborn St, Providence, R. I.
Wing, L J, Mfg Co, W 14th St & 7th Ave, New York, N. Y.
Adv page 194

CONTROL SYSTEMS, HEAT, HOT-WATER, AUTOMATIC

Barber-Colman Co, Rockford, Ill.
Burling Instrument Co, 253 Springfield Ave., Newark, N. J.
Cleveland Steel Products Corp, Wellington, Ohio.
Detroit Lubricator Co, 5900 Trumbull Ave, Detroit, Mich.
Edison, Thomas A, Inc, West Orange, N. J.



COMBUSTION CONTROL

All Sizes of Boilers
All Types of Firing

Low steam costs are the result of high boiler efficiency. Daily performance at test efficiencies will result from the installation of a Republic-Smoot combustion control system. They are designed for all sizes of boilers and all types of fuel firing equipment.

CONSTANT STEAM PRESSURE
Automatically maintains a constant steam pressure by controlling the fuel and air input to the boilers in balance with the boiler load.

EFFICIENT COMBUSTION
Automatically maintains maximum combustion efficiency over entire range of boiler rating, by controlling simultaneously the fuel and air input to boiler in measured proportions and in a fixed ratio.

LOAD DISTRIBUTION
Automatically distributes load equally among all the boilers, or the load can be distributed between the boilers as desired.

TYPICAL INSTALLATIONS

R. C. A. MANUFACTURING CO.
PENICK & FORD, LTD. INC.
JACOB RUPPERT BREWING CO.
W. VIRGINIA PULP & PAPER CO.
BEECHNUT PACKING CO.
TIMKEN ROLLER BEARING CO.
CELANESE CORP.
SWIFT & CO.
KREY PACKING CO.
U. S. MILITARY ACADEMY
U. S. NAVAL ACADEMY
STEVENS HOTEL

FOR COMPLETE DETAILS WRITE FOR DATA BOOK No. S-21

REPUBLIC FLOW METERS CO. 2222 DIVERSEY PKWY. CHICAGO. ILLINOIS

Friez, Julien P, & Sons, Inc, Central Ave, Baltimore, Md.
General Controls Co, 810 Allen Ave, Glendale, Calif.
Hoffman Specialty Co, 1001 York St, Indianapolis, Ind.
Illinois Engineering Co, Racine Ave & 21st St, Chicago, Ill.
Johnson Service Co, 507 E Michigan St, Milwaukee, Wis.
Marsh Tritrol Co, Chicago, Ill.
Mercoid Corp, 4229 Belmont Ave, Chicago, Ill.
Minneapolis-Honeywell Regulator Co, Minneapolis, Minn.
Mueller Co, Decatur, Ill.
Penn Electric Switch Co, Goshen, Ind.
Photoswitch Inc, 21 Chestnut St, Cambridge, Mass.
Powers Regulator Co, 2815 Greenview Ave, Chicago, Ill.
Sarco Co, 475 5th Ave, New York, N. Y.
Taylor Instrument Cos, Rochester, N. Y.
Vapor Car Heating Co, 80 E Jackson Blvd, Chicago, Ill.
Wheelco Instruments Co, 863 W Harrison St, Chicago, Ill.
Adv pages 203, 216, 254, 258

CONTROL SYSTEMS, HEATING, STEAM

Armstrong Heat Control Co, Portland, Ore.
Barber Colman Co, Rockford, Ill.
Dunham, C A, Co, 450 E Ohio St, Chicago, Ill.
Edison, Thomas A, Inc, West Orange, N. J.
Foxboro Co, 38 Neponset Ave, Foxboro, Mass.
Friez, Julien P, Div, 4 N Central Ave, Baltimore, Md.
General Controls Co, 810 Allen Ave, Glendale, Calif.
Illinois Engrg Co, Racine Ave & 21st St, Chicago, Ill.
Johnson Service Co, 507 E Michigan St, Milwaukee, Wis.
Marsh Tritrol Co, Chicago, Ill.
Mason-Neilan Regulator Co, 1186 Adams St, Boston, Mass.
Minneapolis-Honeywell Regulator Co, 2747 4th Ave S, Minneapolis, Minn.
Penn Electric Switch Co, Goshen, Ind.
Photoswitch, Inc, 21 Chestnut St, Cambridge, Mass.
Schaub, Fred H, Engrg Co, 325 W Huron St, Chicago, Ill.
Sterling, Inc, Milwaukee, Wis.
Taylor Instrument Cos, 95 Ames St, Rochester, N. Y.
Vapor Car Heating Co, 80 E Jackson Blvd, Chicago, Ill.
Warren Webster & Co, Camden, N. J.
Adv page 272
Wheelco Instruments Co, 863 W Harrison St, Chicago, Ill.
Adv pages 203, 216, 254, 258

CONTROLLERS, BACK PRESSURE

See Regulators, Pressure)

CONTROLLERS, BALANCED FLOAT

(See Regulators, Liquid-Level)

CONTROLLERS, ELECTRICAL

(See Also Regulators)

Allen-Bradley Co, Milwaukee, Wis.
Allis-Chalmers Mfg Co, Milwaukee, Wis.
Adv pages 6, 7
American Elevator & Machine Co, Louisville, Ky.
Arrow-Hart & Hegeman Elec Co, 105 Hawthorne St, Hartford, Conn.
Barber Colman Co, Rockford, Ill.
Bristol Co, Waterbury, Conn.
Brown Instrument Co, 4490 Wayne Ave, Philadelphia, Pa.
Adv pages 51, 240, 254, 258, 266
Burlington Instrument Corp, 316 Valley Street, Burlington, Iowa.
Clark Controller Co, Cleveland, Ohio
Colt's Patent Firearms Mfg Co, 17 Van Dyke Ave, Hartford, Conn.
Cutler-Hammer Inc, 606 N 12th St, Milwaukee, Wis.
Adv page 107
Electric Controller & Mfg Co, Cleveland, Ohio
Esterline-Angus Co, P O Box 596, Indianapolis, Ind.
General Controls Co, 810 Allen Ave, Glendale, Calif.
General Electric Co, Schenectady, N. Y.
Adv pages 32, 33
General Regulator Corp, 165 Broadway, New York, N. Y.
Adv page 127
Graybar Electric Co, 420 Lexington Ave, New York, N. Y.
Adv pages 214, 234, 243, 263, 265, 282, 284
Industrial Timer Corp, 113 Edison Pl, Newark, N. J.
Leeds & Northrup Co, 4970 Stenton Ave, Philadelphia, Pa.
Adv page 2nd cover
Manning, Maxwell & Moore, Bridgeport, Conn.
Monitor Controller Co, Lombard & Gay Sts, Baltimore, Md.
Ohmite Mfg Co, 4819 Flournoy St, Chicago, Ill.
Penn Electric Switch Co, Goshen, Ind.
Schaub, Fred H, Engrg Co, 325 W Huron St, Chicago, Ill.
Square D Co, Rivard & Piquette Sts, Detroit, Mich.
Tagliabue, C J, Mfg Co, Park & Nostrand Aves, Brooklyn, N. Y.
Ward Leonard Electric Co, 31 South St, Mt Vernon, N. Y.
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61
Wheelco Instruments Co, 863 W Harrison St, Chicago, Ill.
Adv pages 203, 216, 254, 258
Zenith Electric Co, 845 So Wabash Ave, Chicago, Ill.

CONTROLLERS, REMOTE, HYDRAULIC

Sperry Products Inc, 1505 Willow Ave, Hoboken, N. J.
Adv page 289

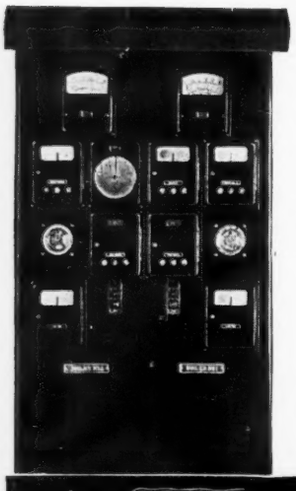
CONTROLLERS, TIME-CYCLE

Autocall Co, Shelby, Ohio
Automatic Temperature Control Co, Germantown Ave & Logan St, Philadelphia, Pa.
Bailey Meter Co, 1036 Ivanhoe Rd, Cleveland, Ohio.
Adv pages 14, 15
Barber Colman Co, Rockford, Ill.
Bristol Co, Waterbury, Conn.
Brown Instrument Co, 4490 Wayne Ave, Philadelphia, Pa.
Adv pages 51, 240, 254, 258, 266
Foxboro Co, 38 Neponset Ave, Foxboro, Mass.
General Electric Co, Schenectady, N. Y.
Adv pages 32, 33
Hagan Corp, Hagan Bldg, Pittsburgh, Pa.
Adv pages 30, 31
Industrial Timer Co, 113 Edison Pl, Newark, N. J.
Koppers Co, Pittsburgh, Pa.
Mason-Neilan Regulator Co, 1186 Adams St, Boston, Mass.
Photoswitch Inc, 21 Chestnut St, Cambridge, Mass.
Tagliabue, C J, Mfg Co, Park & Nostrand Aves, Brooklyn, N. Y.
Taylor Instrument Cos, Rochester, N. Y.
Westinghouse Electric & Mfg Co, Pittsburgh, Pa.
Adv pages 60, 61
Wheelco Instruments Co, 863 W Harrison St, Chicago, Ill.
Adv pages 203, 216, 254, 258

CONVECTORS, HEATING

American Radiator & Std Sanitary Corp, 40 W 40th St, New York, N. Y.
Commodore Heaters Corp, 11 West 42nd St, New York, N. Y.
Dunham, C A, Co, 450 E Ohio St, Chicago, Ill.
McQuay, Inc, Minneapolis, Minn.
Marlo Coil Co, St Louis, Mo.
Modine Mfg Co, Racine, Wis.
Rome Turney Radiator Co, 200 Lynch St, Rome, N. Y.
Trane Co, 2012 Cameron Ave, La Crosse, Wis.
Tuttle & Bailey, Inc, New Britain, Conn.

STRETCH THE STEAM CAPACITY OF YOUR PRESENT BOILERS



HAYS Automatic Combustion Control permits the operation of your boilers closer to their maximum capacity with a greater degree of safety and economy than possible under manual operation. The air and fuel rates are kept in accurate proportion to each other and in direct relation to the plant load.

So—look to your power plant! Be sure you can operate each boiler when necessary at peak capacity—with SAFETY and ECONOMY. You can do it with Hays Automatic Combustion Control.

The HAYS CORPORATION
COMBUSTION INSTRUMENTS AND CONTROL
MICHIGAN CITY, INDIANA, U.S.A.

How to
CONTROL LIQUID LEVELS
without floats or contacts

WHEELCO REMOTE CONTROLS

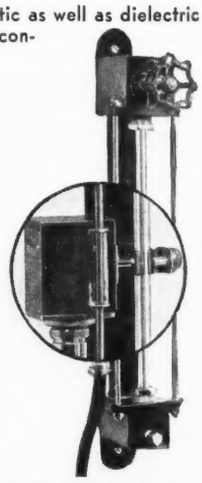
effect control action without any contact with the liquid to be controlled

operate on a differential of .001 to .125 inches change in liquid level

may be used with electrolytic as well as dielectric liquids having dielectric constants as low as 1.8.

OPERATION

Remote Controllers employ Wheelco's famous "Radio Principle." A "Radio Principle" Control System consists, essentially, of an electronic tube and a relay assembly. The electronic tube is maintained in an oscillating condition and thereby generates a high frequency alternating current. This current is conducted to a Pick-up Unit—shown clamped to gage glass at right—by means of a special cable. Any material entering the field of the Pick-up detunes the oscillator. The resulting change in current through the relay operates its contacts.



For Complete Data on Remote Controllers Write for Bulletin 12-3

Wheelco Instruments Co.
863 W. Harrison Street Chicago, Illinois
Originators of "Electronic Principle" Temperature Controls.

CONVERTERS, ROTARY, ELECTRIC

Allis-Chalmers Mfg Co, Milwaukee, Wis.
Adv pages 6, 7
Bogue Electric Co, 80 Glover Ave, Paterson, N. J.
Century Electric Co, 1806 Pine St, St Louis, Mo.
Diehl Mfg Co, Elizabethport, N. J.
Erie Electric Co, 124 Church St, Buffalo, N. Y.
Forbes & Myers, 174 Union St, Worcester, Mass.
General Electric Co, Schenectady, N. Y.
Adv pages 32, 33
Graybar Electric Co, 420 Lexington Ave, New York, N. Y.
Adv pages 214, 234, 243, 261, 265, 282, 284
Janette Mfg Co, 556 W Monroe St, Chicago, Ill.
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61

CONVEYING SYSTEMS, HYDRAULIC

Allen-Sherman-Hoff Co, 227 S 15 St, Philadelphia, Pa.
National Conveyors Co, Inc, 50 Church St, New York, N. Y.
United Conveyor Corp, Dearborn & Van Buren Sts, Chicago, Ill.

CONVEYING SYSTEMS, PNEUMATIC

Allen Billmyre Corp, Daily News Bldg, New York, N. Y.
Allen-Sherman-Hoff Co, 227 S 15 St, Philadelphia, Pa.
Babcock & Wilcox Co, 85 Liberty St, New York, N. Y.
Adv pages 4, 5, 6, 7, 34
Beaumont-Birch Co, 1505 Race St, Philadelphia, Pa.
Brady Conveyors Corp, 20 W Jackson Blvd, Chicago, Ill.
Dracco Corp, 4083 E 116 St, Cleveland, Ohio
Fuller Co, 111 Bridge St, Catasaqua, Pa.
Adv pages 213, 253
Hahn Engineering Div, 233 Broadway, New York, N. Y.
Holly Pneumatic Systems, Inc, Dept 15, 15 E 40th St, New York, N. Y.
Kennedy-Van Saun Mfg & Engrg Corp, 2 Park Ave, New York, N. Y.
National Conveyors Co, 50 Church St, New York, N. Y.
Skinner Heating & Ventilating Co, 1990 N 9th, St. Louis, Mo.
Sterling Blower Co, 791 Windsor St, Hartford, Conn.
Sturtevant, B F, Co, 47 Readville St, Boston, Mass.
Adv pages 40, 41
United Conveyor Corp, Dearborn & Van Buren Sts, Chicago, Ill.
U S Hoffman Machinery Corp, 105 4th Ave, New York, N. Y.

CONVEYORS, BELT

Alvey Ferguson Co, Cincinnati, Ohio
Barber-Greene Co, Aurora, Ill.
Bartlett & Snow, C O, Co, Cleveland, Ohio.
Beaumont-Birch Co, 1505 Race St, Philadelphia, Pa.
Brady Conveyors Corp, 20 W Jackson Blvd, Chicago, Ill.
Chain Belt Co, 1674 W Bruce St, Milwaukee, Wis.
Columbus Conveyor Co, Columbus, Ohio.
Continental Gin Co, 4500 Fifth Ave, South, Birmingham, Ala.
Diamond Iron Works Inc & Mahr Co Div, Minneapolis, Minn.
Elgin Mfg Co, Elgin, Ill.
Fairfield Engrg Co, 305 Barnhart St, Marion, Ohio.
Farquhar, A B, Co, York, Pa.
General Conveyor Co, 38-40 22nd St, Long Island City, N. Y.
General Machinery Co, Riverside Ave, Spokane, Wash.
Gifford-Wood Co, 24 Hill St, Hudson, N. Y.
Godfrey Conveyor Corp, Dept A-77, Elkhart, Ind.
Great Western Mfg Co, Leavenworth, Kansas.
Haslett Chute & Conveyor Co, Oaks, Pa.
Jeffrey Mfg Co, 932-99 N Fourth St, Columbus, Ohio.
Johns Conveyor Div, Osborne Mfg Co, 5401 Hamilton Ave, Cleveland, Ohio.
Kennedy-Van Saun Mfg & Engrg Corp, 2 Park Ave, New York.
Link-Belt Co, 220 S Belmont Ave, Indianapolis, Ind.
Adv page 3
Murray, D J, Mfg Co, Wausau, Wis.
Norfolk Iron Co, N Quincy, Mass.
Palmer-Bee Co, Detroit, Mich.
Pioneer Rubber Mills, 345 Sacramento St, San Francisco, Cal.
Robins Conveying Belt Co, Passaic, N. J.
Adv page 188
Robinson Mfg Co, Muncy, Pa.
Sprout, Waldon & Co, Muncy, Pa.
Standard Conveyor Co, N St. Paul, Minn.
Stephens-Adamson Mfg Co, 5 Ridgeway Ave, Aurora, Ill.
Adv page 175
Webster Mfg Inc, Tiffin, Ohio
Wickwire Spencer Steel Co, 500 Fifth Ave, New York, N. Y.

CONVEYORS, FEEDER

Ajax Flexible Coupling Co, 11 English St, Westfield, N. Y.
Allis-Chalmers Mfg Co, Milwaukee, Wis.
Adv pages 6, 7
Bartlett & Snow, C O, Co, Cleveland, Ohio
Beaumont Birch Co, 1505 Race St, Philadelphia, Pa.
Brady Conveyors Corp, 20 W Jackson Ave, Chicago, Ill.
Chain Belt Co, 1674 W Bruce St, Milwaukee, Wis.
Diamond Iron Works Inc, Minneapolis, Minn.
Fairfield Engrg Co, 305 Barnhart St, Marion, Ohio.
Farquhar, A B, Co, York, Pa.
General Machinery Co, Riverside Ave, Spokane, Wash.
Gifford-Wood Co, 24 Hill St, Hudson, N. Y.
Jeffrey Mfg Co, 932–99 N 4th St, Columbus, Ohio
Johns Conveyor Div, 5401 Hamilton Ave, Cleveland, Ohio.
Kennedy-Van Saun Mfg & Engrg Corp, 2 Park Ave, New York.
Link-Belt Co, 300 W Pershing Rd, Chicago, Ill.
Adv page 3
Palmer-Bee Co, Detroit. Mich.
Robins Conveying Belt Co, Passaic, N. J.
Adv page 188
Savage, W J, Co, Knoxville, Tenn.
Standard Transmission Equipment Co, 416 W 8th St, Los Angeles, Calif.
Stephens-Adamson Mfg Co, 5 Ridgeway Ave, Aurora, Ill.
Adv page 175
Syntron Co, Homer City, Pa.

CONVEYORS, PORTABLE

Alvey-Ferguson Co, Cincinnati, Ohio
Barber-Greene Co, Aurora, Ill.
Diamond Iron Works Inc, Minneapolis, Minn.
Fairfield Engrg Co, 305 Barnhart St, Marion, Ohio.
Farquhar, A B, Co, York, Pa.
General Machinery Co, Riverside Ave, Spokane, Wash.
Godfrey Conveyor Co, Dept A 77, Elkhart, Ind.
Jeffrey Mfg Co, 932-99 N 4th St, Columbus, Ohio.
Link-Belt Co, 2045 W Hunting Park Ave, Philadelphia, Pa.
Adv page 3
Robins Conveying Belt Co, Passaic, N. J.
Adv page 188
Standard Conveyor Co, N St. Paul, Minn.
Standard Transmission Equipment Co, 416 W 8th St, Los Angeles, Calif.
Stephens-Adamson Mfg Co, 5 Ridgeway Ave, Aurora, Ill.
Adv page 175

CONVEYORS, SCRAPER, BUCKET, SCREW, FLIGHT, DRAG

Alpha Tank & Sheet Metal Mfg Co, 5005 S 38th St, St. Louis, Mo.
Alvey-Ferguson Co, Cincinnati, Ohio
Bartlett & Snow, C O, Co, Cleveland, Ohio.
Beaumont Birch Co, 1505 Race St, Philadelphia, Pa.
Brady Conveyors Corp, 20 W Jackson Blvd, Chicago, Ill.
Chain Belt Co, 1674 W Bruce St, Milwaukee, Wis.
Columbus Conveyor Co, Columbus, Ohio.
Continental Gin Co, 4500 Fifth Ave S, Birmingham, Ala.
Diamond Iron Works Inc, Minneapolis, Minn.
Diamond Mfg Co, Wyoming, Pa.
Fairfield Engrg Co, 305 Barnhart St, Marion, Ohio.
Farquhar, A B, Co, York, Pa.
General Machinery Co, Spokane, Wash.
Gifford-Wood Co, 24 Hill St, Hudson, N. Y.
Godfrey Conveyor Co, Dept A 77, Elkhart, Ind.
Jeffrey Mfg Co, 932-99 N 4th St, Columbus, Ohio.
Kennedy-Van Saun Mfg & Engrg Corp, 2 Park Ave, New York, N. Y.
Link-Belt Co, 300 W Pershing Rd, Chicago, Ill.
Adv page 3
McNally Pittsburg Mfg Co, Pittsburg, Kans.
Murray, D J, Mfg Co, Wausau, Wis.
Palmer-Bee Co, Detroit. Mich.
Robins Conveying Belt Co, Passaic, N. J.
Adv page 188
Stephens-Adamson Mfg Co, 5 Ridgeway Ave, Aurora, Ill.
Adv page 175
Webster Mfg Inc, Tiffin, Ohio.

Look for the noun in the product listing, for example:
"Conduit, Electrical"
not
"Electrical Conduit"

COOLERS, BRINE

(See Also Heat Exchangers)
Alberger Heater Co, 287 Chicago St, Buffalo, N. Y.
American Locomotive Co, 30 Church St, New York, N. Y.
Adv pages 42, 172
Andale Co, 1600 Arch St, Philadelphia, Pa.
Baker Ice Machine Co, Inc, Omaha, Neb.
California Steel Products Co, Barrett & A Sts, Richmond, Calif.
Davis Engrg Corp, 1064-16 E Grand St, Elizabeth, N. J.
Frick Co, Inc, 325 Broadway, Waynesboro, Pa.
General Refrigeration Div, Yates-American Machine Co, Beloit, Wis.
Griscom-Russell Co, 385 Madison Ave, New York, N. Y.
Howe Ice Machine Co, 2821 Montrose Ave, Chicago, Ill.
Lummus Co, 420 Lexington Ave, New York, N. Y.
Adv page 192
Richmond Engrg Co, Inc, Seventh & Hospital Sts, Richmond, Va.
Stearns-Roger Mfg Co, Denver, Colo.
Struthers-Wells Titusville Corp, Warren, Pa.
Vesterdahl, Karl, & Co, 90 West St, New York, N. Y.
Vilter Mfg Co, 2217 S 1st St, Milwaukee, Wis.
Vogt, Henry, Machine Co, 1000 W Ormsby St, Louisville, Ky.
Adv page 46
Whitlock Mfg Co, 77 South St, Hartford, Conn.
Adv page 232
Worthington Pump & Machinery Corp, Harrison, N. J.
Adv page 171
York Ice Machinery Corp, York, Pa.

COOLERS, OIL

Alberger Heater Co, 287 Chicago St, Buffalo, N. Y.
Alco Products Div, 36 Church St, New York, N. Y.
Adv page 56, 155
Allis-Chalmers Mfg Co, Milwaukee, Wis.
Adv pages 6, 7
Andale Co, 1600 Arch St, Philadelphia, Pa.
Bell & Gossett Co, Chicago, Ill.
Burt Mfg Co, 232 Main St, Akron, Ohio
Condenser Service & Engrg Co, 310 12th St, Hoboken, N. J.
Adv page 181
Fedders Mfg Co, 63 Tonawanda St, Buffalo, N. Y.
Foster Wheeler Corp, 165 Broadway, New York, N. Y.
Adv pages 38, 39
Griscom-Russell Co, 285 Madison Ave, New York, N. Y.
Harrison Radiator Co, Lockport, N. Y.
Lummus Co, 420 Lexington Ave, New York, N. Y.
Adv page 192
Refrigeration Economics Co, 1232 Second St, NE, Canton, Ohio
Rome-Turney Radiator Co, 200 Lynch St, Rome, N. Y.
Ross Heater & Mfg Co, Inc, 1409 West Ave, Buffalo, N. Y.
Schutte & Koerting Co, 12th & Thompson Sts, Phila, Pa.
Staples & Pfeiffer Ltd, 528 Bryant St, San Francisco, Calif.
Struthers-Wells Corp, Warren, Pa.
Vogt, Henry, Machine Co, 1000 W Ormsby St, Louisville, Ky.
Adv page 146
Wheeler, C H, Mfg Co, Lehigh & Sedgley Aves, Phila, Pa.
Whitlock Mfg Co, 77 South St, Hartford, Conn.
Adv page 232
Worthington Pump & Machinery Corp, Harrison, N. J.
Adv page 171
York Ice Machinery Corp, York, Pa.
Young Radiator Co, Racine, Wis.
Zallea Bros & Johnson, 820 Locust Ave, Wilmington, Del.

COOLERS, UNIT, ROOM

Buffalo Forge Co, 488 Broadway, Buffalo, N. Y.
Adv page 199
Clarage Fan Co, 619 Porter St, Kalamazoo, Mich.
Adv page 147
Fedders Mfg Co, 63 Tonawanda St, Buffalo, N. Y.
Frigidaire Commercial & Air Cond Div, Dayton, Ohio.
General Electric Co, Schenectady, N. Y.
Adv pages 32, 33
General Refrigeration Div, Yates-American Machine Co, Beloit, Wis.
Hastings Air Conditioning Co, Hastings, Nebr.
Howe Ice Machine Co, 2821 Montrose Ave, Chicago, Ill.
Ice Cooling Appliance Corp, Morrison, Ill.
McQuay, Inc, Minneapolis, Minn.
Marlo Coil Co, St Louis, Mo.
Modine Mfg Co, Racine, Wis.
Murray, D J, Mfg Co, Wausau, Wis.
Niagara Blower Co, 6 E 45th St, New York, N. Y.
Palmers Mfg Co, Phoenix, Ariz.
Peerless of America, Inc, Marion, Ind.
Rempe Co, 340 N Sacramento Blvd, Chicago, Ill.
Skinner Heating & Ventilating Co, 1990 N 9th Street, St Louis, Mo.
Trane Co, 2012 Cameron Ave, La Crosse, Wis.
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61
Worthington Pump & Machinery Corp, Harrison, N. J.
Adv page 171
York Ice Machy Corp, York, Pa.
Young Radiator Co, Racine, Wis.

COOLING SYSTEMS, SPRAY

Binks Mfg Co, 3114-40 Carroll Ave, Chicago, Ill.
Buffalo Forge Co, 488 Broadway, Buffalo, N. Y.
Adv page 199
Carrier Corp, Syracuse, N. Y.
Frigidaire Commercial & Air Cond Div, Dayton, Ohio.

Marley Co, Fairfax Rd & Marley Ave, Kansas City, Kans.
Adv page 268
Marlo Coil Co, St. Louis, Mo.
Palmers Mfg Co, Phoenix, Ariz.
Pritchard, J F Co, Dwight Bldg, Kansas City, Mo.
Schubert-Christy Corp, 1600 Georgia St, St. Louis, Mo.
Schutte & Koerting Co, 12th & Thompson Sts, Phila, Pa.
Spray Engrg Co, 111 Central St, Somerville, Mass.
Sturtevant, B F, Co, 47 Readville St, Boston, Mass.
Adv pages 40, 41
Trane Co, 2012 Cameron Ave, La Crosse, Wis.
Yarnall-Waring Co, Chestnut Hill, Philadelphia, Pa.
Adv page 109
York Ice Machy Corp, York, Pa.

COOLING TOWERS

(See Towers, Cooling)

CORK PRODUCTS

Armstrong Cork Co, Industrial Div, Lancaster, Pa.
Adv page 218
Butterworth, B T, Jr, New Canaan, Conn.
Cork Import Corp, 330 West 42nd St, New York, N. Y.
Cork Insulation Co, 155 E 44th St, New York, N. Y.
Mundet Cork Corp, 65 S 11th St, Brooklyn, N. Y.
United Cork Cos, Kearny, N. J.
York Ice Machy Corp, York, Pa.

COUNTERS, REVOLUTION

Bristol Co, Waterbury, Conn.
Durant Mfg Co, 1954 N Buffum St, Milwaukee, Wis.
Lonergan, J E, Co, 211 Race St, Philadelphia, Pa.
Adv page 281
Photoswitch Inc, 21 Chestnut St, Cambridge, Mass.
Veeder-Root Inc, Hartford, Conn.

COUPLINGS, PIPE

Central Forging Co, Catawissa.
Chase Brass & Copper Co, 236 Grand Street, Waterbury, Conn.
Crane Co, 836 S Michigan Ave, Chicago, Ill.
Adv page 123
Dresser Mfg Co, Bradford, Pa.
Adv pages 14, 15, 44, 45, 145
Harrisburg Steel Corp, Harrisburg, Pa.
Jarecki Mfg Co, Erie, Pa.
Kennedy Valve Mfg Co, Elmira, N. Y.
Adv page 191
Kennedy-Van Saun Mfg & Engrg Corp, 2 Park Ave, New York, N. Y.
Limbert, Geo B, & Co, 570 Fulton St, Chicago, Ill.
Malleable Iron Fittings Co, Branford, Conn.
Parker Appliance Co, 17325 Euclid Ave, Cleveland, Ohio.
Pittsburgh Valve & Fittings Corp, Barberton, Ohio.
Walworth Co, Inc, 60 E 42nd St, New York, N. Y.
Adv pages 168, 169
Youngstown Sheet & Tube Co., Youngstown, Ohio
Adv page 189

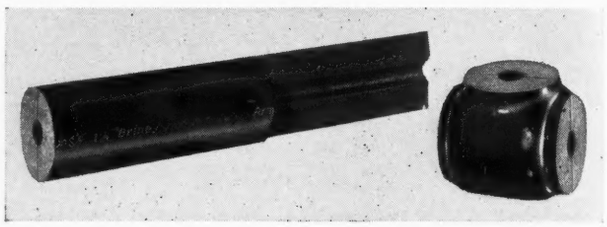
COUPLINGS, SHAFT, FLEXIBLE

Ajax Flexible Coupling Co, 11 English St, Westfield, N. Y.
Allis-Chalmers Mfg Co, Milwaukee, Wis.
Adv pages 6, 7
American Flexible Coupling Co, Erie, Pa.
Atlantic Gear Wks, Inc, 198 Lafayette St, New York, N. Y. N. Y.
Barcus Engineering Co, 393 Falls Rd, Baltimore, Md.
Bartlett Hayward Div, Koppers Co, Scott St, Baltimore, Md.
Bond, Chas, Co, 617-623 Arch St, Philadelphia, Pa.
Boston Gear Works, Inc, North Quincy, Mass.
Brown Engineering Co, 119 E 3rd St, Reading, Pa.
Bruce-Macbeth Engine Co, 2111 Center St, N W, Cleveland, Ohio.
Chicago Pulley & Shafting Co, Chicago, Ill.
Continental Gin Co, 4500 Fifth Ave S, Birmingham, Ala.
Crocker-Wheeler Elec Mfg Co, Ampere, N. J.
Cullman Wheel Co, 1344 Altgeld St, Chicago, Ill.
De Laval Steam Turbine Co, Trenton, N. J.
Adv page 58
Diamond Chain & Mfg Co, 444 Kentucky Ave, Indianapolis, Ind.
Dodge Mfg Co, Mishawaka, Ind.
F A B Mfg Co, Inc, 1249 67th St, Oakland, Calif.
Falk Corp, 3104 W Canal St, Milwaukee, Wis.
Falls Clutch & Machinery Co, Cuyahoga Falls, Ohio.
Farrel-Birmingham Co, Inc, 344 Vulcan St, Buffalo, N. Y.
Foote Bros Gear & Machine Co, Western Blvd, Chicago, Ill.
Adv page 163
Gears & Forgings, Inc, Cleveland, Ohio.
James, D O, Mfg Co, W Monroe, Chicago, Ill.
Jeffrey Mfg Co, 932-99 N 4th St, Columbus, Ohio.
Jones, W A, Foundry & Machine Co, Chicago, Ill.
Pa.
Koppers Co, Pitsburgh, Pa.
Link-Belt Co, 2410 W 18th St, Chicago, Ill.
Adv page 3
Lovejoy Flexible Coupling Co, West Lake St, Chicago, Ill.
Adv page 218
McNally Pittsburg Mfg Co, Pittsburg, Kans.
Mall Tool Co, 7740 S Chicago Ave, Chicago, Ill.
Medart Co, 3548 DeKalb St, St. Louis, Mo.
Meriam Co, Cleveland, Ohio
Mesta Machine Co, P O Box 1466, Pittsburgh, Pa.
Morse Chain Co, Ithaca, N. Y.
Adv page 26
Nicholson, W H, & Co, 125 Oregon St, Wilkes-Barre, Pa.
Adv pages 227, 269, 271
Palmer-Bee Co, Detroit, Mich.
Philadelphia Gear Works, Erie Ave & G Street, Philadelphia, Pa.
Adv page 57
Poole Foundry & Machine Co, Baltimore, Md.
Precision Development Co, College Ave, Salisbury, Md.
Ramsey Chain Co, Inc, 1010 Broadway, Albany, N. Y.
Robins Conveying Belt Co, Passaic, N. J.
Adv page 188
Royersford Foundry & Machine Co, 75 Main St, Royersford, Pa.
Smith & Serrell, 20 Washington Place, Newark, N. J.
Smith, Winfield H, 330 West St, Springville, N. Y.
Spicer Mfg Corp, Toledo, Ohio.
Thermoid Rubber Div, Whitehead Rd, Trenton, N. J.
Thomas Flexible Coupling Co, Warren, Pa.
Union Chain & Mfg Co, Sandusky, Ohio.
Universal Gear Corp, 1452 E 19th St, Indianapolis, Ind.
Waldron, John, Corp, Box 110, New Brunswick, N. J.
Webster Manufacturing Inc, Tiffin, Ohio
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61
Whitney Chain & Mfg Co, 237 Hamilton St, Hartford, Conn.
Wood's, T B, Sons Co, 1165 5th Ave, Chambersburg, Pa.

COUPLINGS, VARIABLE-SPEED

American Blower Corp, 6000 Russell St, Detroit, Mich.

AVAILABLE FOR PROMPT DELIVERY ...ARMSTRONG'S CORK COVERING



CORK covering is available to help you cut refrigeration costs and assure accurate temperature control. Protect cold lines and fittings now with this pure cork material which has high insulating efficiency and unusual moisture-resistance. This insulation will give you satisfactory service for years.

Also 3 insulations in board form

CORKBOARD • FOAMGLAS • MINERAL WOOL BOARD

These three efficient, serviceable materials meet every need for low temperature insulation in board form. Corkboard is available on an A-10 priority rating or better. Foamglas and mineral wool board are available with or without a priority rating. For complete information, write today to Armstrong Cork Company, Building Materials Division, 926 Concord Street, Lancaster, Pennsylvania.

ARMSTRONG CORK COMPANY
Insulation Headquarters

Save Time! Selector Charts on
L-R FLEXIBLE COUPLINGS

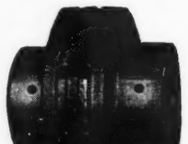
Put exact couplings you need, under your finger!

With L-R Selector Charts and Catalog, you can quickly select just the right couplings for your loads, H.P., R.P.M., and conditions of operation. Ask for them! These are *real* helps for engineers interested in mechanical transmission equipment. Write.

STANDARD FOR ALL POWER TRANSMISSION PROBLEMS
PATS. AND PATS. PENDING

TYPE "IA"
For small pumps and machines,
3/16" to 2¼" bores,
1/6" to 50 H.P. at 1750 R.P.M.

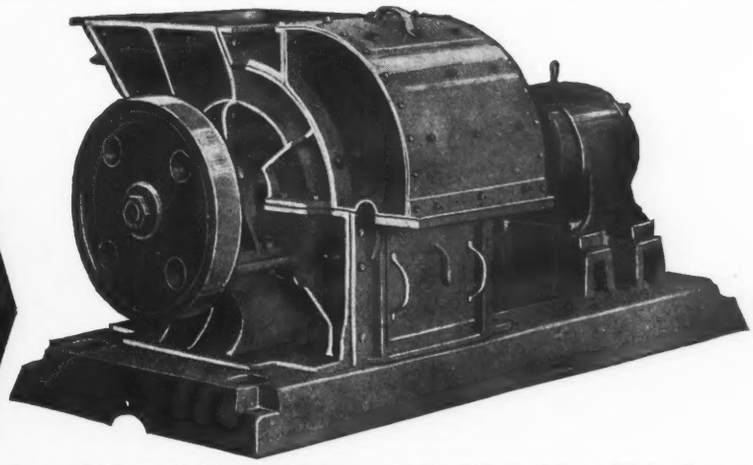
TYPE "H"
HEAVY DUTY
1½" to 9½" bores,
2½ to 806 H.P. at 100 R.P.M.



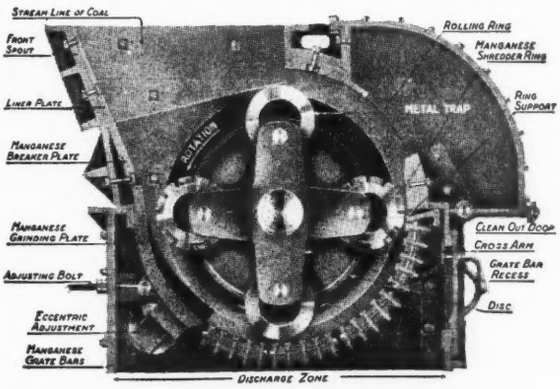
TYPE "W"
GENERAL SERVICE
1½" to 16¾" bores,
2 to 2500 H.P. at 100 R.P.M.

LOVEJOY FLEXIBLE COUPLING CO. 4976 WEST LAKE ST. CHICAGO, ILLINOIS

AMERICAN RING CRUSHERS



SIZE COAL FOR EFFICIENT COMBUSTION



Cross-sectional view of American Ring Crusher

In American Crushers, Manganese Steel Rings apply centrifugal force to strike, roll and grind the coal during the crushing operation.

One of the Manganese Steel Shredder Rings, used in the "American" Crusher which splits the coal and prevents clogging. This is an exclusive "American" feature which eliminates the chance of crushing the coal and is largely responsible for the low cost crushing and exact sizing with the "AMERICAN."

Run-of-mine or lump coal reduced to proper size in one operation—at low cost

American Rolling Ring Crushers differ from other centrifugal crushers in that their housings are heavy steel castings, reinforced with ribs making them unbreakable from any crushing strain.

In operation, centrifugal force is applied at right angles to a horizontal shaft. Material to be crushed enters from the top, falls on the rotor and is struck by rings in suspension which shatter and distribute the coal before it reaches the breaker and grinding plate. By a simple adjustment of the patented grinding plate (made of manganese to insure long wear and sturdiness) coal can be sized to any requirements whether for stoker or pulverized fuel firing.

The average cost of coal crushing with the American is less than 1¢ per ton for all charges including maintenance, power, labor, depreciation and interest on the investment.

SPEED, CAPACITY, HORSEPOWER

No.	SPEED RPM	APPROX. H. P.	APPROXIMATE CAPACITIES 1½"	1¼"	1"	¾"	½"	SIZE LUMP R.O.M.
15S	600-720	20-25	80	50-65	45-50	35-40	25-30	10"
18S	600-720	25-30	90	70-80	60-65	50-55	40-45	12"
24S	600-720	30-40	150	130-140	100-120	80-100	60-70	18"
30S	600-720	50-60	225	175-200	150-170	130-150	80-100	20"
38S	600-720	60-75	300	225-250	200-235	175-200	125-150	24"
42S	600-720	75-100	350	300-325	285-325	275-300	175-200	28"
48S	600-720	100-125	400	350-375	330-350	300-325	225-250	28"
54S	600-720	125-150	450	390-420	360-380	325-340	250-275	28"
60S	600-720	150-175	500	425-450	400-425	350-375	275-300	28"

ASK FOR "AMERICAN" ASSISTANCE

Many leading power plants, by availing themselves of "American" engineering service and recommendations have improved combustion and reduced coal preparation costs. Call on us to analyze your problem and help you solve it.

AMERICAN PULVERIZER COMPANY
1219 Macklind Avenue
St. Louis, Missouri
ORIGINATORS AND MANUFACTURERS OF RING CRUSHERS AND PULVERIZERS

Electric Machinery Mfg Co, 1331 Tyler St, N E, Minneapolis, Minn.
Twin Disc Clutch Co, Racine, Wis.

CRANES, ELECTRIC TRAVELING

American Hoist & Derrick Co, St Paul, Minn.
Chisholm-Moore Hoist Corp, 6015 Fremont, Tonawanda, N. Y.
Cleveland Crane & Engrg Co, Wickliffe, Ohio.
Conco Engrg Wks, Mendota, Ill.
Detroit Hoist & Machine Co, Detroit, Mich.
Euclid Crane & Hoist Co, Euclid, Ohio.
Harnischfeger Corp, Milwaukee, Wis.
Lakeside Bridge & Steel Co, Milwaukee, Wis.
Lane Mfg Co, Montpelier, Vt.
Link-Belt Speeder Corp, 301 W Pershing Rd, Chicago, Ill.
Loudon Machinery Co, Fairfield, Ia.
Northern Engrg Works, Detroit, Mich.
Robbins & Myers Inc, Springfield, Ohio
Shaw-Box Crane & Hoist Div, Muskegon, Mich.
Shepard Niles Crane & Hoist Corp, 453 Schuyler Ave, Montour Falls, N. Y.
Union Mfg Co, New Britain, Conn.
Whiting Corp, 15657 Lathrop Ave, Harvey, Ill.
Wright Mfg Div of American Chain & Cable Co, York, Pa.

CRANES, HAND-POWER

Bradney Machine Co, Inc, Middletown, N. Y.
Bridgeport Chain & Mfg Co, Bridgeport, Conn.
Chisholm-Moore Hoist Corp, 6015 Fremont, Tonawanda, N. Y.
Cleveland Crane & Engrg Co, Wickliffe, Ohio.
Conco Engrg Wks, Mendota, Ill.
Detroit Hoist & Machine Co, Detroit, Mich.
Diamond Iron Works, Minneapolis, Minn.
Euclid Crane & Hoist Co, Euclid, Ohio
Harrington Co, 17th & Callowhill Sts, Philadelphia, Pa.
Hill Acme Co, 6400 Breakwater Ave, Cleveland, Ohio.
Industrial Brownhoist Corp, Bay City, Mich.
Louden Machinery Co, Fairfield, Iowa.
Northern Engrg Works, Detroit.
Palmer-Bee Co, Detroit, Mich.
Shaw-Box Crane & Hoist Div, Muskegon, Mich.
Shepard Niles Crane & Hoist Corp, 453 Schuyler Ave, Montour Falls, N. Y.
Union Mfg Co, New Britain, Conn.
Whiting Corp, 15657 Lathrop Ave, Harvey, Ill.
Wright Mfg Div of American Chain & Cable Co, York, Pa.

CRUSHERS, COAL

American Pulverizer Co, 1029 Macklind Ave, St. Louis, Mo.
Adv page 219
Bartlett & Snow, C O, Co, Cleveland, Ohio
Beaumont Birch Co, 1505 Race St, Philadelphia, Pa.
Diamond Iron Works & Mahr Mfg Co Div, Minneapolis, Minn.
Jeffery Mfg Co, 932-99 N 4th St, Columbus, Ohio.
Kennedy-Van Saun Mfg & Engrg Corp, 2 Park Ave, New York, N. Y.
Koppers Co, Pittsburgh, Pa.
Link-Belt Co, 307 N Michigan Ave, Chicago, Ill.
Adv page 3
McNally Pittsburg Mfg Co, Pittsburg, Kans.
Marion Machine Foundry & Supply Co, Marion, Ind.
Pennsylvania Crusher Co, Phila, Pa.
Robins Conveying Belt Co, Passaic, N. J.
Adv page 188
Stephens-Adamson Mfg Co, 5 Ridgeway Ave, Aurora, Ill.
Adv page 175
Sturtevant Mill Co, Harrison Sq, Dorchester, Boston, Mass.
Adv page 220
Vulcan Iron Works, 750 S Main St, Wilkes-Barre, Pa.
Webster Mfg Inc, Tiffin, Ohio.

CUPS, GREASE

Alemite Div, Stewart-Warner Corp, Chicago, Ill.
American Injector Co, Detroit, Mich.
Bowen Products Corp, Auburn, N. Y.
Crane Co, 836 S Michigan Ave, Chicago, Ill.
Adv page 123
Detroit Lubricator Co, 5900 Trumbull Ave, Detroit, Mich.
Gits Bros Mfg Co, 1846 S Kilbourne Ave, Chicago, Ill.
Hunter Pressed Steel Co, 8000 Maple Ave, Lansdale, Pa.
Jarecki Mfg Co, Erie, Pa.
Keystone Lubricating Co, 21st Clearfield & Lippincott Sts, Phila, Pa.
Link-Belt Co, 519 N Holmes Ave, Indianapolis, Ind.
Adv page 3
Lonergan, J E, Co, 211 Race St, Philadelphia, Pa.
Adv page 281
Lunkenheimer Co, Box 360, Annex Station, Cincinnati, Ohio.
Adv pages 221, 240, 275, 276, 278, 279, 280
Nathan Mfg Co, 250 Park Ave, New York, N. Y.
Powell, Wm, Co, Cincinnati, O.
Adv pages 166, 167
Robins Conveying Belt Co, Passaic, N. J.
Adv page 188
Swift Lubricator Co, 330 James Bldg, Elmira, N. Y.
Williams, D T, Valve Co, Spring Grove Ave, Cincinnati, O.

CUTTING & THREADING TOOLS, PIPE

Beaver Pipe Tools, Inc, 310 Power Ave, Warren, Ohio
Bignall & Keeler Mach Works, 512 Leclaire Ave, Edwardsville, Ill.
Cox & Sons Co, South Bridgeton, N. J.
Curtis & Curtis Co, 302 Garden St, Bridgeport, Conn.
Imperial Brass Mfg Co, 564 S Racine Ave, Chicago, Ill.
Jarecki Mfg Co, Erie, Pa.
Landis Machine Co, Waynesboro, Pa.
Oster Mfg Co, Cleveland, Ohio
Ridge Tool Co, Elyria, Ohio
Toledo Pipe Threading Machine Co, 1441 Summit St, Toledo, Ohio
Trimont Mfg Co, Boston, Mass.

CUTTING TOOLS, BOILER-TUBE

Faessler, J, Mfg Co, Moberly, Mo.
Landis Machine Co, Waynesboro, Pa.
Wiedeke, Gustav, Co, 1833 Richard St, Dayton, Ohio.

DAMPER OPERATORS

(See Operators, Damper)

DAMPERS, DUCT, BREECHING

American Warming & Ventilating Co, Toledo, Ohio.
Anemostat Corp of America, 10 East 39th St, New York, N. Y.
Barber Colman Co, Rockford, Ill.
Connery Construction Co, 2nd & Luzerne Sts, Phila, Pa.
Heacon Inc, Luzerne & 2nd Sts, Philadelphia, Pa.
Hotstream Heater Co, 8007 Grand Ave, Cleveland, Ohio
Mecklenburg Iron Works, P O Box 599, 617 N Summit St, Charlotte, N. C.
Preferred Utilities Mfg Co, New York, N. Y.
Stearns-Roger Mfg Co, Denver, Colo.
Treadwell, M H, Co, 140 Cedar St, New York, N. Y.
Union Boiler & Mfg Co, 52 Vanderbilt Ave, New York, N. Y.

Slash your coal bills!
. . . Pay only for B.T.U.'s received and get this information accurately with the . . . . .
IMPROVED STURTEVANT
AUTOMATIC COAL CRUSHER and SAMPLER

Get full value from your coal . . .

Many plants are now operating at 24-hour capacities thereby using three times more coal than for normal operation. In operating normally, analysis of coal may seem unimportant but consider the loss if you are not getting the true value in your coal purchases, when consuming these additional quantities.

Eliminates 32 hand operations . . .

The Sturtevant Automatic Coal Crusher and Sampler eliminates 32 of the 34 tedious and inaccurate hand operations necessary for the sampling of coal. Every sample taken from this unit is true and representative of all the material passed through it and to a fineness of practically all minus 8 mesh screen size.

Write for Bulletin 85

"SAMPLE YOUR COAL BEFORE YOU BURN IT"

STURTEVANT MILL CO., 103 CLAYTON STREET DORCHESTER, BOSTON, MASS.

LUNKENHEIMER

VALVES

Bronze, Iron, Steel and Corrosion-Resistant Alloy; Globe, Angle, Cross, Check, Gate, Throttle, Non-return, Blow-off, Pop Safety, Relief, Whistle.

OIL AND GREASE CUPS

Glass, Bronze or Aluminum Body Oil Cups; Bottle Oilers; Constant Level Oil Controls; "Glaswick" Oil Cups; Bronze Grease Cups.

BOILER MOUNTINGS

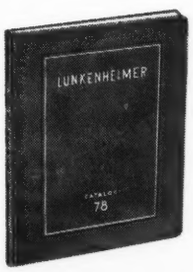
Non-return, Pop Safety and Blow-off Valves; Water Columns, Water Gauges, Gauge Cocks; Fusible Plugs.

LUBRICATORS

For Steam, Gas, Gasoline, Oil Compressor and Pump Cylinders; Gravity Feed or Hydrostatic.

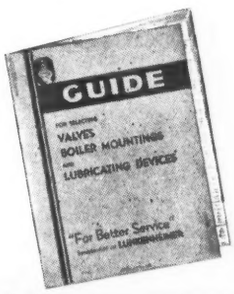
Whistles, Cocks, Unions,

Fittings, Air Nozzles, Etc.



Distributors in all Industrial Centers

Ask for Catalog 78 and the "Guide" or write us direct.



ESTABLISHED 1862

THE LUNKENHEIMER CO.

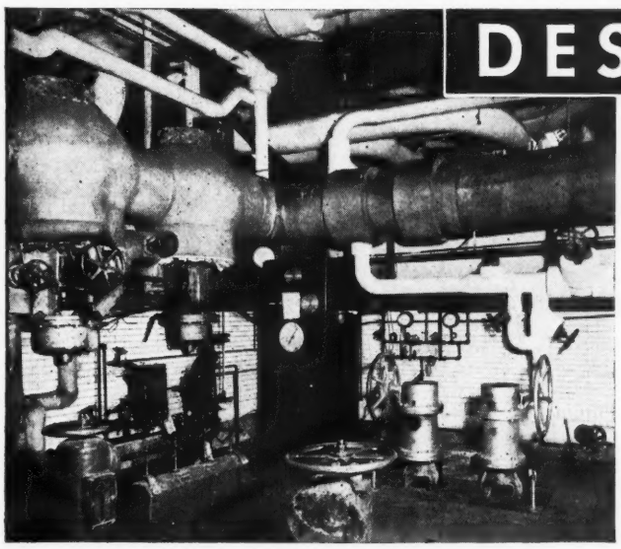
"QUALITY"

CINCINNATI, OHIO. U. S. A.

NEW YORK CHICAGO
BOSTON PHILADELPHIA

EXPORT DEPT. 318-322 HUDSON ST., NEW YORK

DESUPERHEATERS



For Your Special Requirements

Whatever your plant conditions, you can obtain the necessary operating flexibility and accurate regulation of steam temperature with the rugged, simply-controlled Republic-Smoot desuperheaters described below.

RATIO TYPE

This desuperheater is a self-supported venturi in which the desuperheating water, completely evaporated at all flows, is controlled by the steam flow in the correct proportion to reduce the steam temperature to the required value.

RATIO TANK TYPE

This unit is similar to the ratio type except that a water tank is added to give emergency water reserve.

STEAM ATOMIZING TYPE

In this desuperheater, built for extremely wide range operation and zero pressure loss, the desuperheating water is completely atomized at all rates of flow by a small quantity of high-pressure steam.

MECHANICAL TYPE

This unit is designed for special applications such as the control of turbine exhaust temperature or for use where atomizing steam is not available.

A Republic-Smoot engineer will gladly consult with you on your specific desuperheating problem. Write today, without obligation, for further details.

TYPICAL INSTALLATIONS

APPALACHIAN ELECTRIC POWER CO.
BOSTON EDISON CO.
BROOKLYN EDISON CO.
CINCINNATI GAS AND ELECTRIC CO.
E. I. DU PONT DE NEMOURS & CO.
NORTHERN PAPER MILLS
POTOMAC EDISON CO.
JACOB RUPPERT BREWERY
STANDARD OIL CO. OF N. J.
UNION BAG & PAPER CO.
THE TEXAS CO.
UNITED ILLUMINATING CO.

REPUBLIC FLOW METERS CO. 2222 DIVERSEY PKWY. CHICAGO, ILLINOIS

DAMPERS, VIBRATION, SPRING & RUBBER

Butterworth, B T, Jr, New Canaan, Conn.
Korfund Co, 48-23 32nd Pl, Long Island City, N. Y.
Precision Development Co, College Ave, Salisbury, Md.
Vibration Eliminator Co, 8-22 Astoria Blvd, Astoria, L. I.

DEAERATORS

(See Heaters)

DEALERS, EQUIPMENT

(See Searchlight Section of this issue, page 281, and Classified Directory, page 268 of December POWER)

DEEPWELL PUMPS

(See Pumps, Deepwell)

DEHUMIDIFIERS

Air & Refrigeration Corp, 475 Fifth Ave, New York, N. Y.
American Blower Corp, 6000 Russell St, Detroit, Mich.
Aqua Sorb Co, East Orange, N. J.
Bryant Heater Co, 17825 St Clair Ave, Cleveland, Ohio
Carrier Corp, Syracuse, N. Y.
General Electric Co, Schenectady, N. Y.
Adv pages 32, 33
Kaufman, H J, 13215 Roselawn Ave, Detroit, Mich.
Niagara Blower Co, 6 E 45th St, New York, N. Y.
Pittsburgh Lectrodryer Corp, Pittsburgh, Pa.
Refrigeration Economics Co, Canton, Ohio
Ross, J O, Engrg Corp, New York, N. Y.
Surface Combustion Div, Sieloff St, Toledo, Ohio
Trane Co, 2012 Cameron Ave, La Crosse, Wis.
York Ice Machy Corp, York, Pa.

DESUPERHEATERS

Andale Co, 1600 Arch St, Philadelphia, Pa.
Babcock & Wilcox Co, 85 Liberty St, New York, N. Y.
Adv pages 8, 9, 10, 11
Combustion Engrg Co, Inc, 205 Madison Ave, New York, N. Y.
Adv pages 16, 17
Elliott Co, Jeannette, Pa.
Adv pages 4, 5, 187
Foster Wheeler Corp, 165 Broadway, New York, N. Y.
Adv pages 38, 39
General Regulator Corp, 165 Broadway, New York, N. Y.
Adv page 127
Hagan Corp, Hagan Bldg, Pittsburgh, Pa.
Adv pages 30, 31
Keckley, O C, Co, 400 W Madison St, Chicago, Ill.
Northern Equipment Co, 1221 Grove Drive, Erie, Pa.
Adv page 119
Republic Flow Meters Co, 2222 Diversey Pkwy, Chicago, Ill.
Adv pages 215, 221, 241, 280
Schutte & Koerting Co, 12th & Thompson Sts, Phila, Pa.
Spence Engrg Co, Inc, 61 Grant St, Walden, N. Y.
Swartwout Co, 1851 Euclid Ave, Cleveland, Ohio
Adv page 312

DETECTORS, REFRIGERANT-GAS

Frigidaire Commercial & Air Cond Div, Dayton, Ohio
Imperial Brass Mfg Co, 564 S Racine Ave, Chicago, Ill.
Linde Air Products Co, 30 E 42nd St, New York, N. Y.
Adv pages 36, 37
Turner Brass Wks, Sycamore, Ill.

DIAPHRAGM VALVES

(See Valves, Diaphragm)

DIFFUSERS, AIR, HIGH VELOCITY

Air Devices, Inc, 17 East 42nd St, New York, N. Y.
Air & Refrigeration Corp, 475 Fifth Ave, New York, N. Y.
Anemostat Corp of America, 10 E 39th St, New York, N. Y.
Barber Colman Co, Rockford, Ill.
Dorex Div, W B Conner Engrg Corp, 114 E 32nd St, New York, N. Y.
Knowles Mushroom Ventilator Co, Montclair, N. J.
Tuttle & Bailey, Inc, New Britain, Conn.
Waterloo Register Co, Waterloo, Iowa

DC GENERATORS

(See Generators, Electric)

DC MOTORS

(See Motors, Electric)

DIESEL ENGINES

(See Engines, Oil)

DOORS, FURNACE

Plibrico Jointless Firebrick Co, 1818 Kingsbury St, Chicago, Ill.
Adv pages 205, 206, 255, 282
Reintjes, George P, Co, 2517 Jefferson St, St Louis, Mo.

DRESSERS, COMMUTATOR

Graybar Electric Co, 420 Lexington Ave, New York, N. Y.
Adv pages 214, 234, 243, 261, 265, 282, 284
Grobet File Corp of America, 421 Canal St, New York, N. Y.
Ideal Commutator Dresser Co, 1025 Park Ave, Sycamore, Ill.
Martindale Electric Co, 1385 Hird Ave, Cleveland, Ohio

DRESSING, BELT

Acheson Colloids Corp, 3000 Washington Ave, Port Huron, Mich.
Alexander Bros, 410 N 3rd St, Philadelphia, Pa.
Baldwin Belting & Leather Co, 85 Chambers St, New York, N. Y.
Cling-Surface Co, Buffalo, N. Y.
Dixon, Joseph, Crucible Co, 170 Wayne St, Jersey City, N. J.
Adv page 186
Goodrich, B F, Co, 460 S Main St, Akron, Ohio
Graton & Knight Co, Worcester, Mass.
Houghton, E F, & Co, 244-50 W Somerset St, Phila, Pa.
Page Belting Co, Concord, N. H.
Pennwell Oil & Belting Co, 5 White St, New York, N. Y.
Philadelphia Belting Co, 6th & Spring Garden Sts, Phila, Pa.
Raniville, F, Co, Grand Rapids, Mich.
Rhoads, J E, & Sons, 35 N Sixth St, Philadelphia, Pa.
Rockwood Mfg Co, 1801 English Ave, Indianapolis, Ind.
Schieren, Chas A, Co, 30-39 Ferry St, New York, N. Y.
Schwartz Belting Co, 74 Murray St, New York, N. Y.
Standard Oil of Cal, Standard Oil Building, San Francisco, Cal.
Standard Oil Co, Ind, 910 S Michigan Ave, Chicago, Ill.
Stephenson Mfg Co, Albany, N. Y.
Whiting Leather & Belting Co, 9 Murray St, New York, N. Y.
Williams, I B & Son, 73 Murray St, New York, N. Y.

DRIERS, COAL

Allis-Chalmers Mfg. Co, Milwaukee, Wis.
Adv pages 11, 19, 37, 43
American Process Co, Sea Girt, N. J.
Babcock & Wilcox Co, 85 Liberty St, New York, N. Y.
Adv pages 8, 9, 10, 11
Bartlett, C O, & Snow Co, Cleveland, Ohio
Bos-Hatten, Inc, Buffalo, N. Y.
Kennedy-Van Saun Mfg & Engrg Corp, 2 Park Ave, New York, N. Y.
Koppers Co, Pittsburgh Pa.
Link-Belt Co, 300 W Pershing Rd, Chicago, Ill.
Adv page 3
McNally Pittsburg Mfg Co, Pittsburg, Kans.

DRILLS, PNEUMATIC, ELECTRIC, PORTABLE

Black & Decker Mfg Co, Towson, Md.
Buckeye Portable Tool Co, Dayton, Ohio
Chicago Pneumatic Tool Co, 6-8 E 44th St, New York, N. Y.
Clark, Jas, Electric Co, Louisville, Ky.
Cleveland Pneumatic Tool Co, Cleveland, Ohio
Graybar Electric Co, 420 Lexington Ave, New York, N. Y.
Adv pages 214, 234, 243, 261, 265, 282, 284
Independent Pneumatic Tool Co, 600 W Jackson Blvd, Chicago
Ingersoll-Rand Co, 11 Broadway, New York, N. Y.
Keeler, Wm H, Inc, Grand Haven, Mich.
Mall Tool Co, 7740 S Chicago Ave, Chicago, Ill.
Millers Falls Co, 59 Wells St, Greenfield, Mass.
Ryerson, Jos T, & Sons, Inc, 16 & Rockwell Sts, Chicago, Ill.
Skilsaw Inc, 5033 Elston Ave, Chicago, Ill.
Snap-On Tools Corp, Kenosha, Wis.
Standard Electrical Tool Co, 1918 W 8th, Cincinnati, Ohio
Stearns-Roger Mfg Co, Denver, Colo.
Sullivan Machinery Co, Michigan City, Ind.
Syntron Co, 492 Lexington Ave, Homer City, Pa.

DUST COLLECTORS

(See Collectors, Dust)

ECONOMIZERS

American Locomotive Co, 30 Church St, New York, N. Y.
Adv pages 56, 155
Babcock & Wilcox Co, 85 Liberty St, New York, N. Y.
Adv pages 8, 9, 10, 11
Bros, Wm, Boiler & Mfg Co, Nicollet Island Minneapolis, Minn.
Combustion Engrg Co, Inc, 205 Madison Ave, New York, N. Y.
Adv pages 16, 17
Edge Moor Iron Works, 30 Rockefeller Plaza, New York
Adv page 182
Erie City Iron Works, 1422 East Ave, Erie, Pa.
Foster Wheeler Corp, 165 Broadway, New York, N. Y.
Adv pages 38, 39
Green Fuel Economizer Co, 627 Main St, Beacon, N. Y.
Heilman Boiler Works, Allentown, Pa.
Keeler, E, Co, Williamsport, Pa.
Adv page 125
Richmond Engrg Co, 7th & Hospital Sts, Richmond, Va.
Riley Stoker Corp, 999 Neponset St, Worcester, Mass.
Adv pages 96, 97
Springfield Boiler Co, Springfield, Ill.
Adv pages 28, 29
Stover Steel Tank & Mfg Co, Freeport, Ill.
Sturtevant, B F, Co, 47 Readville St, Mass.
Adv pages 40, 41
Wickes Boiler Co, 515 N Washington Ave, Saginaw, Mich.

EJECTORS

American Injector Co, Detroit, Mich.
Condenser Service & Engineering Co, 310 12th St, Hoboken, N. J.
Adv page 181
Corning Glass Works, Dept IP, Corning, N. Y.
Croll-Reynolds Engrg Corp, 17 John St, New York, N. Y.
Duriron Co, Inc, Dayton, Ohio
Economy Pumps Inc, Hamilton, Ohio
Elliott Co, Jeannette, Pa.
Adv pages 4, 5, 187
Fischer & Porter Co, 60 County Line Rd, Hatboro, Pa.
Foster Wheeler Corp, 165 Broadway, New York, N. Y.
Adv pages 38, 39
Hancock Valve Div, Manning, Maxwell & Moore, 143 Elias St, Bridgeport, Conn.
Ingersoll-Rand Co, 11 Broadway, New York, N. Y.
Adv pages 168, 169
Jarecki Mfg Co, Erie, Pa.
Logansport Machine Inc, 914 Cotner Rd, Logansport, Ind.
Lummus Co, 420 Lexington Ave, New York, N. Y.
Adv page 192

Look for the noun in the product listing, for example:

"Condensers, Surface"
not
"Surface Condensers"

Nathan Mfg Co, 250 Park Ave, New York, N. Y.
Quimby Pump Co, Inc, 347 Thomas St, Newark, N. J.
Ross Heater & Mfg Co, Inc, 1409 West Ave, Buffalo, N. Y.
Schutte & Koerting Co, 12th & Thompson Sts, Phila, Pa.
Sellers, Wm, & Co, 1600 Hamilton St, Philadelphia, Pa.
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61
Wheeler, C H, Mfg Co, Lehigh & Sedgley Aves, Phila, Pa.

ELECTRIC DRILLS

(See Drills, Pneumatic, Electric, Portable)

ELECTRIC GENERATORS

(See Generators)

ELECTRIC RECTIFIERS

(See Rectifiers, Electric)

ELECTRIC RELAYS

(See Relays, Electric)

ELECTRICAL CONDUIT

(See Conduit, Electrical)

ELECTRICALLY OPERATED VALVES

(See Valves, Motor-Operated)

HIGH VACUUM EJECTORS

CROLL-REYNOLDS

Croll-Reynolds Evactors represent the highest modern development in steam jet ejectors as indicated by operating installations totalling over three thousand. Croll-Reynolds Chill-Vactors apply this type of vacuum equipment for chilling water and certain solutions. Other Croll-Reynolds products include FlexoDisc Expansion Joints, Heaters, Deaerators, Condensers and Heat Exchangers.

CROLL-REYNOLDS ENGRG. CO.,
17 JOHN ST., NEW YORK, N. Y.

ELECTRODES, ARC OR GAS WELDING

(See Rods, Welding)

ELEVATORS, PASSENGER AND FREIGHT

American Elevator & Machine Co, Louisville, Ky.
Atlantic Elevator Co, Erie Ave & D St, Philadelphia, Pa.
Bay State Elevator Co, Springfield, Mass.
Chelsea Elevator Co, 551 W 52nd St, New York, N. Y.
Energy Elevator Co, 219 New St, Philadelphia, Pa.
General Electric Co, Schenectady, N. Y.
Adv pages 32, 33
Gurney Elevator Co, 109 W 64th St, New York, N. Y.
Haughton Elevator Co, Toledo, Ohio.
OK Clutch & Machy Co, Columbia, Pa.
Otis Elevator Co, 260 11th Ave, New York, N. Y.
Rosenberg Elevator Co, 3745 N Richard St, Milwaukee, Wis.
Schatzman Elevator Co, Reading, Pa.
Warner Elevator Mfg Co, 2603 Grove Ave, Cincinnati, O.
Warsaw Elevator Co, Danville, Va.

ENGINES, DIESEL

(See Engines, Oil)

ENGINES, GAS

Allis-Chalmers Mfg Co, Milwaukee, Wis.
Adv pages 6, 7
Atlas Imperial Diesel Engine Co, 1000 19th Ave, Oakland, Cal.
Bruce-Macbeth Engine Co, 2111 Center St, N W, Cleveland, Ohio
Caterpillar Tractor Co, Peoria, Ill.
Chicago Pneumatic Tool Co, 6-8 E 44th St, New York, N. Y.
Clark Bros Co, Olean, N. Y.
Climax Engrg Co, 1003 Allen Bldg, Dallas, Tex.
Cooper-Bessemer Corp, Mt Vernon, Ohio
Dissinger, C H A, & Bros, Co, Inc, Wrightsville, Pa.
Enterprise Engine & Foundry Co, 2902 19th St, San Francisco, Calif.
Fairbanks, Morse & Co, 600 S Michigan Ave, Chicago, Ill.
Ingersoll-Rand Co, 11 Broadway, New York, N. Y.
Adv pages 168, 169
International Harvester Co, 180 N Michigan Ave, Chicago, Ill.
Le Roi Co, Milwaukee, Wis.
Lorimer Diesel Engine Co, 16th & Wood Sts, Oakland, Cal.
National Transit Pump & Machine Co, Oil City, Pa.
Novo Engine Co, 1 Porter St, Lansing, Mich.
Rathbun-Jones Engrg Co, Toledo, Ohio
Reid, Joseph, Gas Engine Co, Box 177, Oil City, Pa.
Sterling Engine Co, 1252 Niagara St, Buffalo, N. Y.
Superior Engine Div, National Supply Co, Springfield, Ohio
Titusville Iron Works Co, Titusville, Pa.
Waukesha Motor Co, Waukesha, Wis.
Weber Engine Co, 12th & Winchester Sts, Kansas City, Mo.
Western Engine Co, 1101 Meridian Ave., Alhambra, Cal.
Witte Engine Works, 1600 Oakland Bldg, Kansas City, Mo.
Worthington Pump & Machinery Corp, Harrison, N. J.
Adv page 171

ENGINES, GASOLINE

Allis-Chalmers Mfg Co, Milwaukee, Wis.
Adv pages 6, 7
Briggs & Stratton Corp, Milwaukee, Wis.
Buda Co, Harvey, Ill.
Buffalo Gasoline Motor Co, Buffalo, N. Y.
Caterpillar Tractor Co, Peoria, Ill.
Climax Engrg Co, 1003 Allen Bldg, Dallas, Tex.
Dissinger, C H A, & Bros, Co, Inc, Wrightsville, Pa.
Fairbanks, Morse & Co, 600 S Michigan Ave, Chicago, Ill.
Hercules Motor Corp, Canton, O.
International Harvester Co, 180 N Michigan Ave, Chicago, Ill.
Lauson Co, New Holstein, Wis.
Le Roi Co, Milwaukee, Wis.
Lycoming Mfg Div, Williamsport, Pa.
Mall Tool Co, 7740 S Chicago Ave, Chicago, Ill.
Novo Engine Co, 1 Porter St, Lansing, Mich.
Sterling Engine Co, 1252 Niagara St, Buffalo, N. Y.
Stover Mfg & Engine Co, Ellis St, Freeport, Ill.
Waukesha Motor Co, Waukesha, Ill.
Witte Engine Works, 1600 Oakland Bldg, Kansas City, Mo.

ENGINES, OIL

Allis-Chalmers Mfg Co, Milwaukee, Wis.
Adv pages 6, 7
American Locomotive Co, 30 Church St, New York, N. Y.
Adv pages 56, 155
Anderson Diesel Engine Co, 6245 State Rd, Tacony, Pa.
Atlas Imperial Diesel Engine Co, 1000 19th Ave, Oakland, Cal.
Baldwin De La Vergne Sales Corp, Paschall P O, Phila, Pa.
Ball-Muncie Engine Co, Muncie, Ind.
Bauer, Frank, & Co, 51 N Dean St, Englewood, N. J.
Bolinders Co, Inc, 33 Rector St, New York, N. Y.
Buckeye Machine Co, Lima, Ohio
Buda Co, Harvey, Ill.
Busch-Sulzer Bros Diesel Engine Co, 2nd & Utah, St Louis Mo.
Caterpillar Tractor Co, Peoria, Ill.
Chicago Pneumatic Tool Co, 6-8 E 44th St, New York, N. Y.
Clark Bros Co, Olean, N. Y.
Continental Gin Co, 4500 Fifth Ave, South, Birmingham, Ala.
Cooper-Bessemer Corp, Mt Vernon, Ohio
Cummins Engine Co, Columbus, Ind.
Electric Boat Co, Groton, Conn.
Enterprise Engine & Foundry Co, 2902 19th St, San Francisco, Calif.
Fairbanks, Morse & Co, 600 S Michigan Ave, Chicago, Ill.
Fulton Iron Works, 6400 Gambleton Pl, St Louis, Mo.
General Motors Sales Corp, Cleveland, Ohio
Guiberson Diesel Engine Co, 1000 Forest Ave, Dallas, Tex.
Hercules Motors Corp, Canton.
Hill Diesel Engine Co, Lansing, Mich.
Hooven, Owens, Rentschler Div, Genl Mach Corp, Hamilton, O.
Ingersoll-Rand Co, 11 Broadway, New York, N. Y.
Adv pages 168, 169
International Harvester Co, 180 N Michigan Ave, Chicago, Ill.
Johnson Mfg Co, Fox & Holly Sts, Seattle, Wash.
Kahlenberg Bros Co, Two Rivers, Wis.
Lister-Blackstone Inc, 1706 S 68th St, Milwaukee, Wis.
Lorimer Diesel Engine Co, 16th & Wood Sts, Oakland, Cal.
Mack Mfg Co, 34th St & 48th Ave, Long Island City, N. Y.
Menasco Mfg Co, 805 S San Fernando Rd, Burbank, Cal.
Murphy Diesel Co, 5317 W Burnham St, Milwaukee, Wis.
Nordberg Mfg Co, 3073 S Chase Ave, Milwaukee, Wis.
Peet & Powers, Inc, 70 E 45th St, New York, N. Y.
Power Mfg Co, Marion, Ohio
Rathbun-Jones Engrg Co, Toledo, Ohio
Reid, Joseph, Gas Engine Co, Box 177, Oil City, Pa.
Sheppard, R H, Co, Hanover, Pa.
Standard Diesel Engine Co, 150 Whiton St, Jersey City, N. J.
Stover Mfg & Engine Co, Ellis St, Freeport, Ill.
Superior Engine Div, National Supply Co, Springfield, Ohio
Titusville Iron Works Co, Titusville, Pa.
Union Diesel Engine Co, 2200 E 7th St, Oakland, Calif.
Venn-Severin Machine Co, 1317 W North Ave, Chicago, Ill.
Washington Iron Works, 6th Ave South, Seattle, Wash.
Weber Engine Co, 12th & Winchester Sts, Kansas City, Mo.
Waukesha Motor Co, Waukesha, Wis.
Western Engine Co, 1101 Meridian Ave, Alhambra, Cal.
Witte Engine Works, 1600 Oakland Bldg, Kansas City, Mo.
Wolverine Motor Works, Inc, Bridgeport, Conn.
Worthington Pump & Machinery Corp, Harrison, N. J.
Adv page 171

ENGINES, STEAM

Allis-Chalmers Mfg Co, Milwaukee, Wis.
Adv pages 6, 7
Ames Iron Works, Oswego, N. Y.
Blake Pump Co, Fitchburg, Mass.
Dake Engine Co, 633 Monroe St, Grand Haven, Mich.
Elliott Co, Ridgeway, Pa.
Adv pages 4, 5, 187
Erie City Iron Works, 1422 East Ave, Erie, Pa.
Filer & Stowell Co, 147 E Becher St, Milwaukee, Wis.
Hardie-Tynes Mfg Co, Birmingham, Ala.
Harrisburg Foundry & Machine Co, Harrisburg, Pa.
Johnson Mfg Co, Fox & Holly Sts, Seattle, Wash.
Keeler, Godfrey, Co, Inc, 77 Warren St, New York, N. Y.
Morris Machine Works, 100 E Genessee, Baldwinsville, N. Y.
Murray Iron Works Co, Burlington, Iowa.
Adv page 148
Nagle Engine & Boiler Works, Erie, Pa.
Nordberg Mfg Co, 3073 S Chase Ave, Milwaukee, Wis.
Providence Engrg Works, Providence, R. I.
Skinner Engine Co, Dept U, Erie, Pa.
Sturtevant, B F, Co, 47 Readville St, Boston, Mass.
Adv pages 40, 41
Troy Engine & Machine Co, 142 Railroad Ave, Troy, Pa.
Adv page 50
Vilter Mfg Co, 2217 S 1st St, Milwaukee, Wis.
Wachs, E H, Co, Dayton St, Chicago, Ill.
Willamette Iron & Steel Corp, Portland, Ore.
Wilson Snyder Mfg Div, Braddock, Pa.

EVAPORATIVE CONDENSERS

(See Condensers, Evaporative)

EVAPORATORS

Alco Products Div, 36 Church St, New York, N. Y.
Adv pages 56, 155
Babcock & Wilcox Co, 85 Liberty St, New York, N. Y.
Adv pages 8, 9, 10, 11
Blaw-Knox Co, Pittsburgh, Pa.
Adv pages 24, 25
Croll-Reynolds Engrg Co, 17 John St, New York, N. Y.
Adv pages 222, 239
Davis Engrg Corp, 1064-16 E Grand Ave, Elizabeth, N. J.
Foster Wheeler Corp, 165 Broadway, New York, N. Y.
Adv pages 38, 39
Frigidaire Commercial & Air Cond Div, Dayton, Ohio
General Refrigeration Div, Yates-American Machine Co, Beloit, Wis.
Griscom-Russell Co, 285 Madison Ave, New York, N. Y.
Henszey Co, Dept D-14, Watertown, Wis.
Kopperman, Jos, & Sons, 312-16 New St, Philadelphia, Pa.
Manistee Iron Works, Manistee, Mich.
Peerless of America, Marion, Ind.
Ross Heater & Mfg Co, Inc, 1409 West Ave, Buffalo, N. Y.
Schutte & Koerting Co, 12th & Thompson Sts, Phila, Pa.
Squier, Geo L, Mfg Co, Buffalo, N. Y.
Stearns-Roger Mfg Co, Denver, Colo.
Stokes, F J, Machine Co, Olney P O, Philadelphia, Pa.
Struthers-Wells Corp, Warren, Pa.
Swenson Evaporator Co, Harvey, Ill,
U S Pipe & Foundry Co, Burlington, N. J.
Westinghouse Electric & Mfg Co, East Pittsburgh, Pa.
Adv pages 60, 61
Zallea Bros & Johnson, 820 Locust St, Wilmington, Del.
Zaremba Co, Buffalo, N. Y.

EXPANDERS, BOILER-TUBE

Dudgeon, Richard, Inc, 24 Columbia St, New York, N. Y.
Faessler, J Mfg Co, Moberly, Mo.
Helwig Mfg Co, St Paul, Minn.
Key Co, Alta Sita, East St Louis, Ill.
Wiedeke, Gustav, Co, 1833 Richard St, Dayton, Ohio

EXPANSION JOINTS

(See Joints, Expansion)

EXTINGUISHING CHEMICALS, FIRE

Adams, O H, Co, 2018 E Thomas Ave, Milwaukee, Wis.
Cardox Corp, 307 N Michigan Ave, Chicago, Ill.
Adv page 196
Dugas Chemical Co, Marinette, Wis.
Extingo Corp, Springfield, Ohio
Goss, C B & F H, Inc, 158 Essex St, Melrose, Mass.
Halco Chemical Corp, 551 Fifth Ave, New York, N. Y.
Hall, C P, Co, 2510 First-Central Tower Bldg, Akron, Ohio
Insulating Products Co, 900 E 1st St, Los Angeles, Cal.
M-H-A Mfg Co, 208 Lafayette, Audubon, N. Y.
Pyrene Mfg Co, Newark, N. J.
Soilacide Lab, 51 James St, Montclair, N. J.
Standard Oil of Calif, San Francisco, Cal.

EXTINGUISHING EQUIPMENT, FIRE

American - LaFrance - Foamite Corp, 708 Erie St, Elmira, N. Y.
Badger Fire Extinguisher Co, Park Square Bldg, Boston, Mass.
Cardox Corp, 307 N Michigan Ave, Chicago, Ill.
Adv page 196
Central Automatic Sprinkler Co, 261 E Ashmead St, Philadelphia, Pa.
C-O-Two Fire Equipment Co, 10 Empire St, Newark, N. J.
Du Gas Chemical Co, Marinette, Wis.
Edison, Thomas A, Inc, West Orange, N. J.
Elkhart Brass Mfg Co, Elkhart, Ind.
Graybar Electric Co, 420 Lexington Ave, New York, N. Y.
Adv pages 214, 234, 243, 261, 265, 282, 284
Grinnell Co, 277 W Exchange St, Providence, R. I.
Adv page 156
Halco Chemical Corp, 551 Fifth Ave, New York, N. Y.
Kidde, Walter & Co, 6 West St, Bloomfield, N. J.
Pulmosan Safety Equipment, 176 John St, Brooklyn, N. Y.
Pyrene Mfg Co, 560 Belmont Ave, Newark, N. J.
Rockwood Sprinkler Co, 54 Harlow St, Worcester, Mass.
Sellers, Wm, & Co, 1600 Hamilton St, Philadelphia, Pa.

FABRICATED PIPING SYSTEMS

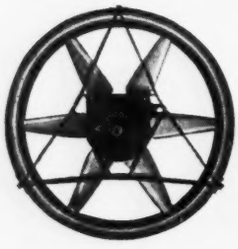
(See Piping Systems, Fabricated, Welded)

FANS, CENTRIFUGAL

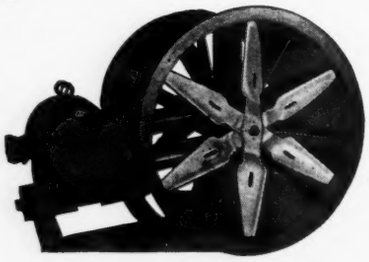
American Blower Corp, 6000 Russell St, Detroit, Mich.
Ballantyne Co, 222 N 16th St, Omaha, Neb.
Buffalo Forge Co, 488 Broadway, Buffalo, N. Y.
Adv page 199
Campbell Heating Co, Des Moines, Iowa
Chelsea Fan & Blower Co, 1206 Grove St, Irvington, N. J.
Clarage Fan Co, 619 Porter St, Kalamazoo, Mich.
Adv page 147
Coppus Engrg Corp, 350 Park Ave, Worcester, Mass.
Duriron Co, Dayton, Ohio
Eclipse Fuel Engrg Co, 707 S Main St, Rockford, Ill.
Grand Rapids Blow Pipe & Dust Arrester Co, Grand Rapids, Mich.

For airplane accessory manufacturer. Special 50 M.P.H. blower — two 24" dia., 6-blade fans, each driven by a ¾ H.P. adjustable speed motor. Blast velocity and direction adjustable.

ENGINEERED to meet the specific air-moving and ventilating requirements of munitions makers, armament factories, and all kinds of industrial plants, South Bend Air Products are playing a big part in national defense. • In addition to specially designed equipment like the unit illustrated above, we offer a broad range of standardized units—two shown below. Motors for use in explosive gases can be provided with all units. • Complete advisory service by competent engineers . . . Outline your problem and/or ask for descriptive material.



Dynaflow fans—two, four or six blade—for exhausting or blowing against moderate static pressures. 16" to 36" diameters.



Dynaflow—Ductype (Belt Driven) for use in ducts. Single or tandem fan units. 16" to 36" diameters; ⅛ to 10 H.P.

SOUTH BEND AIR PRODUCTS INC.
301 EAST COLFAX AVENUE, SOUTH BEND, INDIANA

Green Fuel Economizer Co, 627 Main St, Beacon, N. Y.
Hastings Air Conditioning Co, Hastings, Neb.
Ilg Electric Ventilating Co, Chicago, Ill.
Jeffrey Mfg Co, 932–99 N 4th St, Columbus, Ohio
Lehigh Fan & Blower Co, Allentown, Pa.
Marley Co, Fairfax Rd & Marley Ave, Kansas City, Kans.
Adv page 268
Niagara Blower Co, 6 E 45th St, New York, N. Y.
Prat-Daniel Corp, 80 S Water St, Port Chester, N. Y.
Adv pages 212, 262
Sturtevant, B F, Co, 47 Readville St, Boston, Mass.
Adv pages 40, 41
Trane Co, 2012 Cameron Ave, La Crosse, Wis.

FANS, PROPELLER

Aerovent Fan Co, Piqua, Ohio
American Blower Corp, 6000 Russell St, Detroit, Mich.
Buffalo Forge Co, 488 Broadway, Buffalo, N. Y.
Adv page 199
Chelsea Fan & Blower Co, 1206 Grove St, Irvington, N. J.
Clarage Fan Co, 619 Porter St, Kalamazoo, Mich.
Adv page 147
Coppus Engrg Corp, 350 Park Ave, Worcester, Mass.
De Bothezat Ventilating Equip Div, East Moline, Ill.
Diehl Mfg Co, Elizabethport, N. J.
Graybar Electric Co, 420 Lexington Ave, New York, N. Y.
Adv pages 214, 234, 243, 261, 265, 282, 284
Hartzell Propeller Fan Co, Herman Ave, Piqua, Ohio
Ilg Electric Ventilating Co, Chi-
Jeffrey Mfg Co, 932-99 N 4th
cago, Ill.
St, Columbus, Ohio
Kontrol-Fan, Inc, 4031 Goodwin Ave, Los Angeles, Cal.
Marley Co, Fairfax Rd & Marley Ave, Kansas City, Kans.
Adv page 268
Pritchard, J F Co, Dwight Bldg, Kansas City, Mo.
Adv page 119
South Bend Air Products Inc, 322 E Colfax Ave, South Bend, Ind.
Adv page 224
Sturtevant, B F, Co, 47 Readville St, Boston, Mass.
Adv pages 40, 41
Wagner Electric Corp, St Louis, Mo.
Wing L J, Mfg Co, W 14th St & 7th Ave, New York, N. Y.
Adv page 194

FEEDER CONVEYORS

(See Conveyors, Feeder)

FEEDERS, CHEMICAL

Allis-Chalmers Mfg. Co. Milwaukee, Wis.
Adv pages 6, 7
American Water Softener Co, Philadelphia, Pa.
Bacharach, E W, & Co, Kansas City, Mo.
Bird-Archer Co, 400 Madison Ave, New York, N. Y.
Adv pages 225, 238, 282, 283
Black, Sivalls & Bryson, Inc, Oklahoma City, Okla.
Cochrane Corp, 3100 N 17th St, Philadelphia, Pa.
Adv pages 154, 233, 240, 261, 269
Condenser Service & Engrg Co, 310 12th St, Hoboken, N. J.
Adv page 181
Dearborn Chemical Co, 310 S Michigan Ave, Chicago, Ill.
Elgin Softener Corp, 130 N Grove St, Elgin, Ill.
Adv page 283
Fischer & Porter Co, 60 County Line Rd, Hatboro, Pa.
Fuller Co, 111 Bridge St, Catasaqua, Pa.
Adv pages 213, 253
Graver Tank & Mfg Co, 4816-10 Tod Ave, E Chicago, Ind.
Haering, D W, & Co, 205 W Wacker Drive, Chicago, Ill.
Hagan Corp, Hagan Bldg, Pittsburgh, Pa.
Hungerford & Terry, Inc, Clayton, N. J.
Infilco, Inc, 325 W 25th Place, Chicago, Ill.
Jeffrey Mfg Co, 932-99 N 4th St, Columbus, Ohio
Loomis-Manning Filter Co, 1421 South 37th St, Philadelphia, Pa.
McKays Co, St Paul, Minn.
Madden, P E, Co, 352 W Walton St, Chicago, Ill.
Manzel Bros Co, 326 Babcock St, Buffalo, N. Y.
Merrick Scale Mfg Co, 178 Autumn St, Passaic, N. J.
Milton, Roy, Pump Co, 1305 E Mermaid Ave, Chestnut Hill, Philadelphia, Pa.
National Aluminate Corp, 6222 W 66th Place, Chicago, Ill.
Adv page 113
Permutit Co, Dept A, 330 W 42nd St, New York, N. Y.
Adv pages 152, 159
Perolin Co of N. Y., 551 5th Ave, New York, N. Y.
Proportioneers, Inc, 7 Codding St, Providence, R. I.
Richardson Scale Co, 690 Van Houten Ave, Clifton, N. J.
Savage, W J, Co, Knoxville, Tenn.
Scaife, Wm B, & Sons Co, River & Ann St, Oakmont, Pa.
Stover Steel Tank & Mfg Co, Freeport, Ill.
Syntron Co, Homer City, Pa.
Water Treatment Co of America, 1151 Hodgkiss Street, Pittsburgh, Pa.
Adv page 142

FEEDERS, COAL

Babcock & Wilcox Co, 85 Liberty St, New York, N. Y.
Adv pages 8, 9, 10, 11
Bartlett, C O, & Snow Co, Cleveland, Ohio
Beaumont Birch Co, 1505 Race St, Philadelphia, Pa.
Combustion Engineering Co, 205 Madison Ave, New York, N. Y.
Adv pages 16, 17
Fairfield Engrg Co, 305 Barnhart St, Marion, Ohio
Foster Wheeler Corp, 165 Broadway, New York, N. Y.
Adv pages 38, 39
Fuller Co, 111 Bridge St, Catasaqua, Pa.
Adv pages 213, 253
Gifford-Wood Co, 24 Hill St, Hudson, N. Y.
Jeffrey Mfg Co, 932-99 N 4th St, Columbus, Ohio.
Kennedy-Van Saun Mfg & Engrg Corp, 2 Park Ave, New York, N. Y.
Link-Belt Co, 300 W Pershing Rd, Chicago, Ill.
Adv page 3
McNally Pittsburg Mfg Co, Pittsburg, Kans.
Merrick Scale Mfg Co, 178 Autumn St, Passaic, N. J.
Stephens-Adamson Mfg Co 5 Ridgeway Ave, Aurora, Ill.
Adv page 175
Syntron Co, 492 Lexington Ave. Homer City, Pa.

FEEDWATER-TEST KITS

Allis-Chalmers Mfg Co, Milwaukee, Wis.
Adv pages 6, 7
Betz, W H & L D, Gillingham & Worth Sts, Philadelphia, Pa.
Adv pages 203, 225, 262, 284
Bird-Archer Co, 400 Madison Ave, New York, N. Y.
Adv pages 225, 238, 282, 283
Dearborn Chemical Co, 310 S Michigan Ave, Chicago, Ill.
Elgin Softener Corp, 130 N Grove Ave, Elgin, Ill.
Adv page 283
Haering, D W, & Co, 205 W Wacker Drive, Chicago, Ill.
National Aluminate Corp, 6222 W 66th Place, Chicago, Ill.
Adv page 113
Permutit Co, Dept A, 330 W 42nd St, New York, N. Y.
Adv pages 152, 159
Power Plant Specialty Co, 431 South Dearborn Street, Chicago, Ill.
Rice, Cyrus Wm, & Co, 15 Noble Ave, Pittsburgh, Pa.
Swartwout Co, 18511 Euclid Ave, Cleveland, Ohio
Adv page 312
Taylor, W A & Co, 7300 York Rd, Baltimore, Md.
Water Treatment Co of America, 1151 Hodgkiss St, Pittsburg, Pa.
Adv page 142

FELT, HAIR

Ehret Magnesia Mfg Co, Inc, Valley Forge, Pa.
Adv pages 157
Johns-Manville, 22 E 40th St, New York, N. Y.
Adv pages 44, 45
Standard Asbestos Mfg Co, 820 W Lake St, Chicago, Ill.
Western Felt Works, 4117 Ogden Ave, Chicago, Ill.

FELT PACKINGS

(See Packing, Felt)

FERRULES, CONDENSER-TUBE

Chase Brass & Copper Co, 236 Grand St, Waterbury, Conn.
Crane Packing Co, 1801 Cuyler Ave, Chicago, Ill.
Scovill Mfg Co, 99 Mill St, Waterbury, Conn.
Adv page 111
Torrington Mfg Co, Torrington, Conn.

FIBRE PACKING

(See Packing, Fibre)

FIBRE, VULCANIZED

Continental Diamond Fibre Co, Dept 18, Newark, Del.
General Electric Co, Schenectady, N. Y.
Adv pages 32, 33
National Vulcanized Fibre Co, Wilmington, Del.
Wilmington Fibre Specialty Co, Wilmington, Del.

FILTERS, AIR

Air-Maze Corp, 5120 Harvard Ave, Cleveland, Ohio
Alco Valve Co, 2628 Big Bend Blvd, St Louis, Mo.
American Air Filter Co, Louisville, Ky.
Bailey Meter Co, 1036 Ivanhoe Rd, Cleveland, Ohio
Adv pages 14, 15
Bayley Blower Co, 1817 S 66th St, Milwaukee, Wis.
Burgess Battery Co, Acoustic Div, 2815 W Roscoe St, Chicago, Ill.
Adv page 244
Centrifix Corp, Dept P, 3029 Prospect Avenue, Cleveland, Ohio
Coppus Engrg Corp, 350 Park Ave, Worcester, Mass.
Cuno Engrg Corp, Meriden, Conn.
Detroit Lubricator Co, 5900 Trumbull Ave, Detroit, Mich.
Dracco Corp, 4083 E 116th St, Cleveland, Ohio.
Fisher Governor Co, 203 S 1st Ave, Marshalltown, Iowa
Holly Pneumatic Systems, Inc, Dept 15, 15 E 40th St, New York, N. Y.
Hugo Mfg Co, West Duluth, Minn.
Kauffman Air - Conditioning Corp, St Louis, Mo.
Kaye & McDonald Inc, 91 Franklin Ave, West Orange, N. J.
Kraissl Co, Hackensack, N. J.
Logansport Machine, Inc, 914 Cotner Rd, Logansport, Ind.
Michiana Products Corp, Michigan City, Ind.
Norgren, C A, Co, 210 Santa Fe Drive, Denver, Colo.
Oakite Products, Inc, 23 Thames St, New York, N. Y.
Owens-Corning Fiberglas Corp, Toledo, Ohio.
Purolator Products Inc, 365 Frelinghuysen Ave, Newark, N. J.
Skinner Purifiers, Inc, 1500 Trombly Ave, Detroit, Mich.
Sly, W W, Mfg Co, Cleveland, Ohio.
Somers, H J, Inc, Detroit, Mich.
Staynew Filter Corp, 25 Leighton Ave, Rochester, N. Y.
Vortox Mfg Co, Claremont, Calif.

FILTERS, OIL

Alemite Div, 1826 W Diversey Pkwy, Chicago, Ill.
American Bosch Corp, 3664 Main St, Springfield, Mass.
Bousman Mfg Co, Inc, Grand Rapids, Mich.
Bowser, S F, & Co, 1302 E Creighton Ave, Ft Wayne, Ind.
Burt Mfg Co, 232 Main St, Akron, Ohio
Cuno Engrg Corp, Meriden, Conn.
De Luxe Products Corp, La Porte, Ind.
Fischer & Porter Co, 60 County Line Rd, Hatboro, Pa.
Hilliard Corp, 4 W 4th St, Elmira, N. Y.
Honan-Crane Corp, Lebanon, Ind.
Kraissl Co, Hackensack, N. J.
Logansport Machine Inc, 914 Cotner Rd, Logansport, Ind.
Nugent, Wm W, & Co, 402 N Hermitage Ave, Chicago, Ill.
Olixir Products Co, 887 Niagara St, Buffalo, N. Y.
Plouff Co, 1150 Columbus Ave, Boston, Mass.
Purolator Products Inc, 365 Frelinghuysen Ave, Newark, N. J.
Skinner Purifiers Inc, 1500 Trombly Ave, Detroit, Mich.
Staynew Filter Corp, 25 Leighton Ave, Rochester, N. Y.

FILTERS, WATER

American Water Softener Co, Philadelphia, Pa.
Bacharach, E W, & Co, Kansas City, Mo.
Cochrane Corp, 3106 N 17th St, Philadelphia, Pa.
Adv pages 154, 233, 240, 261, 269
Cuno Engrg Corp, Meriden, Conn.
Elgin Softener Corp, 130 N Grove Ave, Elgin, Ill.
Adv page 283
Elliott Co, Jeannette, Pa.
Adv pages 4, 5, 187
Graver Tank & Mfg Co, 4816-10 Tod Ave, E Chicago, Ind.
Infilco, Inc, 325 W 25th Place, Chicago, Ill.
Kraissl Co, Hackensack, N. J.
Liquid Carbonic Corp, 3100 S 1421 S 37th St, Phila, Pa.
Loomis-Manning Filter Mfg Co, Kedzie Ave, Chicago, Ill.
McKays Co, St Paul, Minn.
Permutit Co, Dept A, 330 W 42nd St, New York, N. Y.
Adv pages 152, 159
Plouff Co, 1150 Columbus Ave, Boston, Mass.
Power Plant Specialty Co, 431 S Dearborn, Chicago, Ill.
Scaife, Wm B, & Sons, Co, River & Ann St, Oakmont, Pa.
Skinner Purifiers Inc, 1500 Trombly Ave, Detroit, Mich.
Staynew Filter Corp, 25 Leighton Ave, Rochester, N. Y.
Stover Steel Tank & Mfg Co, Freeport, Ill.
Water Treatment Co of America, 1151 Hodgkiss St, Pittsburgh, Pa.
Adv page 142
Watson-Stillman Co, Roselle, N. J.
Adv page 226
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61
Worthington Pump & Machinery Corp, Harrison, N. J.
Adv page 171

FIRE-EXTINGUISHING CHEMICALS

(See Extinguishing Chemicals, Fire)

FIRE-EXTINGUISHING EQUIPMENT

(See Extinguishing Equipment, Fire and Extinguishing Chemicals, Fire)

FIRE SPRINKLER SYSTEMS

(See Sprinkler Systems, Fire)

FIREBRICK

(See Brick, Fire. Also Refractories)

FIRST-AID SUPPLIES

Elmer & Amend, 635 Greenwich St, New York, N. Y.
Mine Safety Appliances Co, Pitsburgh, Pa.
Pulmosan Safety Equipment, 176 John St, Brooklyn, N. Y.

FITTINGS, CONDUIT

Appleton Electric Co, 1701-29 Wellington Ave, Chicago, Ill.
Chase Brass & Copper Co, 236 Grand St, Waterbury Conn.

ONE ORGANIZATION TO HANDLE ALL WATER PROBLEMS

WATER ANALYSIS...

Apparatus and Chemicals

The Laboratory Supply Division of W. H. & L. D. Betz offers many types of testing equipment pertaining to water analysis. Betz Laboratories have designed most of this equipment, improving or originating procedures for chemical analysis. If you have a specific or unusual problem of water analysis or plant control, write for information to the attention of our Laboratory Supply Division. A 20-page illustrated catalog is available.

★

W. H. & L. D. BETZ

Consultants on ALL Water Problems

FRANKFORD • PHILADELPHIA • PENNA.

LABORATORIES AND ENGINEERS LOCATED THROUGHOUT U. S. A. AND CANADA

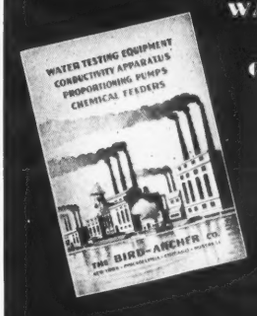
WATER TESTING EQUIPMENT

CONDUCTIVITY APPARATUS

PROPORTIONING PUMPS

CHEMICAL FEEDERS

CHEMICAL REAGENTS



A twenty page booklet illustrating test set combinations with complete instructions for making all necessary water tests, mailed without charge upon receipt of your request.

THE BIRD-ARCHER CO.

Scientific Water Conditioning

SINCE 1885

New York, N. Y. 100 Madison Ave.

Chicago, Ill. Wrigley Building

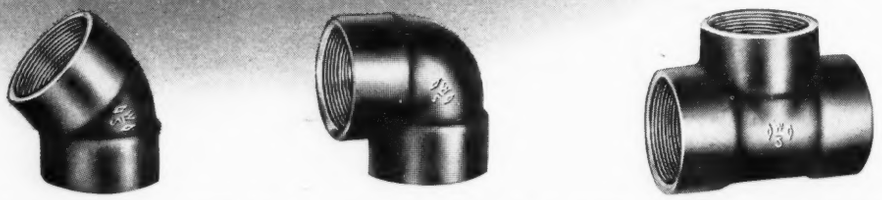
Philadelphia, Pa. 1337 No. American St.

The Bird-Archer Co. Ltd. McGill Building, Montreal, Canada

DEPEND ON THIS

Double Diamond

When you see it on Fittings



WHEN you use Watson-Stillman high-pressure, high-temperature Forged Steel Fittings for *all* of your needs, you can save yourself trouble *now* and save yourself money *in years to come.* The extra endurance of these Forged Steel "heavy-weights" outweighs their cost. That's true economy, true conservation this year and any year.

The Watson-Stillman line includes screwed fittings and socket welding fittings, designed with more than ample metal sections and built with uniform wall thickness.

90 degree elbows, tees, 45 degree elbows, crosses, street elbows, laterals and crosses are forged solid from steel billets. Couplings, reducers, bushings, caps and plugs are machined from solid bars.

Bulletin A-3 lists all available Watson-Stillman fittings.

When you see it on Valves

THE double diamond W-S trade-mark on a valve assures you of the same heavy-duty sturdiness that it stands for when you see it on a fitting.

Watson-Stillman makes bronze and forged steel globe, angle and check valves for high-pressure, high-temperature service, therefore giving you a margin of safety on lower pressures.

New valves have been added to make the line of greater use. Like Watson-Stillman fittings, these valves are available through mill supply distributors.

Bulletin A-4 describes and illustrates these valves.

FREE *Just write us on your business letterhead and ask for Bulletin A-3 on Fittings and Bulletin A-4 on Valves. The Watson-Stillman Co., Roselle, N. J.*

WATSON-STILLMAN

Engineers and Manufacturers of Forged Steel Valves and Fittings, Hydraulic Machinery and Equipment—Hydraulic Presses, Pumps and Jacks

General Electric Co, Schenectady, N. Y.
Adv pages 32, 33
National Electric Products Corp, Pittsburgh, Pa.
Ric-wiL Co, 1562 Union Commerce Bldg, Cleveland, Ohio
Adv page 193

FITTINGS, PIPE, FLANGED

Chase Brass & Copper Co, 236 Grand St, Waterbury, Conn.
Chiksan Tool Co, Brea, Cal.
Crane Co, 836 S Michigan Ave, Chicago, Ill.
Adv page 123
Jarecki Mfg Co, Erie, Pa.
Kennedy Valve Mfg Co, Elmira, N. Y.
Adv page 191
Limbert, Geo B, & Co, 570 Fulton St, Chicago, Ill.
National Lead Co, 111 Broadway, New York, N. Y.
National Valve & Mfg Co, 3102 Liberty Ave, Pittsburgh, Pa.
Adv page 200
Pittsburgh Piping & Equip Co, 12 43rd St, Pittsburgh, Pa.
Adv page 179
Stockham Pipe Fittings Co, Birmingham, Ala.
Vogt, Henry, Machine Co, 1000 W Ormsby St, Louisville, Ky.
Adv page 46
Walworth Co, Inc, 60 E 42nd St, New York, N. Y.
Adv pages 172, 173
Warren Foundry & Pipe Corp, 11 Broadway, New York, N. Y.
Watson-Stillman Co, Roselle, New Jersey.
Adv page 226

FITTINGS, PIPE, THREADED

Bonney Forge & Tool Works, 718 N Meadow, Allentown, Pa.
Adv page 141
Chase Brass & Copper Co, 236 Grand St, Waterbury, Conn.
Chiksan Tool Co, Brea, Cal.
Crane Co, 836 S Michigan Ave, Chicago, Ill.
Adv page 123
Grinnell Co, Inc, 277 W Exchange St, Providence, R. I.
Adv page 156
Jarecki Mfg Co, Erie, Pa.
Kennedy Valve Mfg Co, Elmira, N. Y.
Adv page 191
Limbert, Geo B, & Co, 570 Fulton St, Chicago, Ill.
Powell, Wm, Co, Cincinnati, O.
Adv pages 166, 167
Stockham Pipe Fittings Co, Birmingham, Ala.
Vogt, Henry, Machine Co, 1000 W Ormsby St, Louisville, Ky.
Adv page 46
Walworth Co, 60 E 42nd St, New York, N. Y.
Adv pages 172, 173
Watson-Stillman Co, Roselle, N. J.
Adv page 226

FITTINGS, PIPE, WELDING

American Rolling Mill Co, 7001 Curtis St, Middletown, Ohio
Bonney Forge & Tool Works, 718 N Meadow, Allentown, Pa.
Adv page 141
Chase Brass & Copper Co, 236 Grand St, Waterbury, Conn.
Chiksan Tool Co, Brea, Cal.
Crane Co, 836 S Michigan Ave, Chicago, Ill.
Adv page 123
Grinnell Co, Inc, 277 W Exchange St, Providence, R. I.
Adv page 156
Limbert, Geo B, & Co, 570 Fulton St, Chicago, Ill.
Midwest Piping & Supply Co, 1450 S 2nd St, St Louis, Mo.
Adv page 43
Taylor Forge & Pipe Works, P O Box 485, Chicago, Ill.
Adv page 198
Tube Turns, Inc, 251 E Broadway, Louisville, Ky.
Adv page 115
Vogt, Henry, Machine Co, 1000 W Ormsby St, Louisville, Ky.
Adv page 46
Walworth Co, 60 E 42nd St, New York, N. Y.
Adv pages 172, 173
Watson-Stillman Co, Roselle, N. J.
Adv page 226

FITTINGS, REFRIGERATION

Baker Ice Machine Co, Inc, Omaha, Neb.
Chase Brass & Copper Co, 236 Grand St, Waterbury Conn.
Frick Co, Inc, 325 Broadway, Waynesboro, Pa.
Frigidaire Commercial & Air Conditioning Division, Dayton, Ohio
General Refrigeration Div, Yates-American Machine Co, Beloit, Wis.
Imperial Brass Mfg Co, 564 S Racine Ave, Chicago, Ill.
Vesterdahl, Karl, & Co, 90 West St, New York, N. Y.
Vilter Mfg Co, 2217 S 1st St, Milwaukee, Wis.
Vogt, Henry, Machine Co, 1000 W Ormsby St, Louisville, Ky.
Adv page 46
Walworth Co, 60 E 42nd St, New York, N. Y.
Adv pages 172, 173
Watson-Stillman Co, Roselle, N. J.
Adv page 226
Worthington Pump & Machinery Corp, Harrison, N. J.
Adv page 171
York Ice Machinery Corp, York, Pa.

FITTINGS, TUBE, COMPRESSION OR SOLDER

American Brass Co, Waterbury, Conn.
Adv page 121
Chase Brass & Copper Co, 236 Grand St, Waterbury, Conn.
Crane Co, 836 S Michigan Ave, Chicago, Ill.
Adv page 123
Dole Valve Co, 1901–1941 Carroll Ave, Chicago, Ill.
Dresser Mfg Co, Bradford, Pa.
Eclipse Aviation Corp, Wissahickon Ave, Philadelphia, Pa.
Imperial Brass Mfg Co, 564 Racine Ave, Chicago, Ill.
Limbert, Geo B, & Co, 570 Fulton St, Chicago, Ill.
Lunkenheimer Co, Box 360, Annex Station, Cincinnati, Ohio
Adv pages 221, 240, 275, 276, 278, 279, 280
Mueller Brass Co, 1925A Lapeer Ave, Port Huron, Mich.
Nugent, Wm W, & Co, 402 N Hermitage Ave, Chicago, Ill.
Parker Appliance Co, 17325 Euclid Ave, Cleveland, Ohio.
Walworth Co, Inc, 60 E 42nd St., New York, N. Y.
Adv pages 168, 169

FLAX PACKING

(See Packing, Flax)

FLEXIBLE COUPLINGS

(See Couplings, Shaft, Flexible)

FLEXIBLE-METAL TUBING

(See Tubing, Metal)

FLOATS

Corning Glass Works, Dept IP, Corning, N. Y.
Ernst Water Column & Gauge Co, Livingston, N. J.
Adv page 150
Harris, Arthur & Co, 212 N Aberdeen St, Chicago, Ill.
Hercules Float Works, 200 Franklin St, Springfield, Mass.
Adv page 150
Kieley & Mueller, Inc, 2015-2033 43rd St, N Bergen, N. J.
Naugatuck Mfg Co, 460 N Main St, Naugatuck, Conn.
Nicholson, W H, & Co, 125 Oregon St, Wilkes-Barre, Pa.
Adv pages 227, 269, 271
Reliable Gauge Column Co, 5902 Carnegie Ave, Cleveland, Ohio
Adv pages 52, 53
Sexauer, J A Mfg Co, 2503 Third Avenue, New York, N. Y.
Stover Steel Tank & Mfg Co, Freeport, Ill.
Wright-Austin Co, Detroit, Mich.

FLOAT VALVES

(See Valves, Float)

FLOOR GRATING

(See Grating, Floor)

FLOOR PLATES

(See Plates, Floor)

FLOORING, IRON & STEEL

(See Plates, Floor)

UNITED STATES GAUGE COMPANY

INDICATING and RECORDING PRESSURE GAUGES

All Sizes and Types for Every Purpose

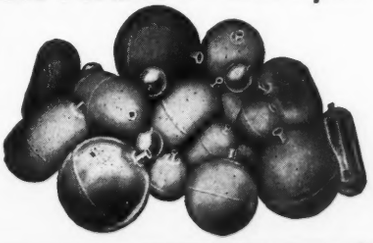
44 BEAVER STREET NEW YORK

NICHOLSON WELDED FLOATS

Die Formed — Not Spun

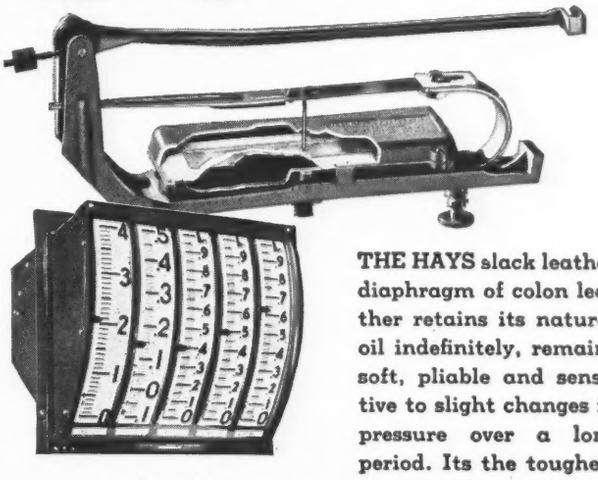
Nicholson die-formed floats are built right at the outset. That's why they can withstand steam pressures up to 1500 lbs. and a hydrostatic pressure of 2500 lbs. Nicholson floats are die formed in halves from chrome-nickel or stainless steel and then reinforced by welding the seams. Finished in chromium. Cadium, Nickel or Copper plating . . . . Sizes from 2½ to 14 in.

Write Us for Catalog and Prices



W. H. NICHOLSON & CO.
125 Oregon Street Wilkes-Barre, Pennsylvania.

Tough ... *YET SENSITIVE TO .0025 OF AN INCH!*



THE HAYS slack leather diaphragm of colon leather retains its natural oil indefinitely, remains soft, pliable and sensitive to slight changes in pressure over a long period. Its the toughest pliable substance known, successfully withstands sudden pressure shock. New book "Draft-What-Why-Where" tells all about draft and draft measurement. Send for your copy today.

The HAYS CORPORATION
SINCE 1907 COMBUSTION INSTRUMENTS AND CONTROL MICHIGAN CITY, INDIANA, U.S.A.

FLOW METERS
(See Meters, Flow)

FLYASH COLLECTORS
(See Collectors, Flyash)

FURNACE WALLS
(See Walls)

FRICTION CLUTCHES
(See Clutches, Friction)

FURNACES, WASTE-FUEL
Furnace Economy Co, 201 N Wells St, Chicago, Ill.
Hofft, M A, Co, 814 W Washington Ave, Indianapolis, Ind.
Stearns-Roger Mfg Co, Denver, Colo.

FUSES
Bussmann Mfg Co, University at Jefferson, St Louis, Mo.
Colt's Patent Fire Arms Mfg Co, Hartford, Conn.
G & W Electric Specialty Co, 7780 Dante Ave, Chicago, Ill.
General Electric Co, Schenectady, N. Y.
Adv pages 32, 33
Graybar Electric Co, 420 Lexington Ave, New York, N. Y.
Adv pages 214, 234, 243, 261, 265, 282, 284
Ideal Commutator Dresser Co, 1025 Park Ave, Sycamore, Ill.
Jefferson Electric Co, Bellwood, Ill.
Littelfuse, Inc, 4757 Ravenswood Avenue, Chicago, Ill.
Metropolitan Electric Mfg Co, 22-48 Steinway, Long Island City, N. Y.
Pacific Electric Mfg Corp, 5815 Third St, San Francisco, Calif.
Railway & Industrial Engrg Co, Greensburg, Pa.
Schweitzer & Conrad, Inc, 4435 Ravenswood, Chicago, Ill.
Southern States Equipment Co, Birmingham, Ala.
Trico Fuse Mfg Co, 2955 N 5th St, Milwaukee, Wis.
Ware Bros, 4500 W Lake St, Chicago, Ill.
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61

FUSIBLE PLUGS
(See Plugs)

GAGE BOARDS
(See Boards, Gage)

GAGE COCKS
(See Water Columns)

GAGE SNUBBERS
Campbell, J A, Co, Long Beach, Calif.
Meriam Co, Cleveland, Ohio.
Ray Pressure Snubber Co, Charlotte, N. C.
Robinson, John R, 354 W 31st St, New York, N. Y.

GAGES, AMMONIA, FREON
Ashton Valve Co, 165 1st St, Cambridge, Mass.
Bristol Co, Waterbury, Conn.
Crosby Steam Gage & Valve Co, 40 Church St, New York.
Lonergan, J E Co, 211 Race St, Philadelphia, Pa.
Adv page 281
Manning, Maxwell & Moore, Inc, Bridgeport, Conn.
Marsh, Jas P, Corp, 2049 Southport Ave, Chicago, Ill.
Star Brass Mfg Co, 110 E Dedham St, Boston, Mass.
U. S. Gauge Co, 44 Beaver St, New York, N. Y.
Adv page 227
Vogt, Henry, Machine Co, 1000 W Ormsby St, Louisville, Ky.
Adv page 46
York Ice Machy Corp, York, Pa.

GAGES, DRAFT
Bacharach Industrial Inst Co, 7000 Bennett St, Pittsburgh,
Adv page 289
Bailey Meter Co, 1036 Ivanhoe Road, Cleveland, Ohio.
Adv pages 14, 15
Bristol Co, Waterbury, Conn.
Brown Instrument Co, 4490 Wayne Ave, Philadelphia, Pa.
Adv pages 51, 240, 254, 258, 266
Defender Automatic Regulator Co, St Louis, Mo.
Dwyer, F W, Mfg Co, 561 W Washington St, Chicago, Ill.
Ellison Draft Gage Co, 214 W Kinzie St, Chicago, Ill.
Foxboro Co, 38 Neponset Ave, Foxboro, Mass.
Friez, Julien P, & Sons, 4 N Central Ave, Baltimore, Md.
Hays Corp, 905 8th St, Michigan City, Ind.
Adv pages 202, 216, 227, 254
Hotstream Heater Co, 8007 Grand Ave, Cleveland, Ohio
Manning, Maxwell & Moore, Inc, Bridgeport, Conn.
Meriam Co, W 112th St, Cleveland, Ohio
Peabody Engrg Corp, 580 5th Ave, New York, N. Y.
Adv page 153
Republic Flow Meters Co, 2222 Diversey Pkwy, Chicago, Ill.
Adv pages 215, 221, 241, 280
Uehling Instrument Co, 470 Getty Ave, Paterson, N. J.
Wheelco Instruments Co, 863 W Harrison St, Chicago, Ill.
Adv pages 203, 216, 254, 258

GAGES, LIQUID-LEVEL
Alemite Div, 1826 W Diversey Pkwy, Chicago, Ill.
American Injector Co, Detroit,
Bailey Meter Co, 1036 Ivanhoe Rd, Cleveland, Ohio
Adv pages 14, 15
Bastian-Blessing Co, 4201 Peterson Ave, Chicago, Ill.
Bordo, L J, Co, 115 New St, Glenside, Pa.
Bristol Co, Waterbury, Conn.
Brown Instrument Co, 4490 Wayne Ave, Philadelphia, Pa.
Adv pages 51, 240, 254, 258, 266
Builders-Providence Inc, 7 Codding St, Providence, R. I.
Adv page 242
Crosby Steam Gage & Valve Co, 40 Church St, New York, N. Y.
Defender Automatic Regulator Co, St Louis, Mo.
Diamond Power Specialty Corp, Box 288, Detroit, Mich.
Adv pages 116, 117
Ernst Water Column & Gage Co, Livingston, N. J.
Adv page 150
Esterline-Angus Co, Box 596, Indianapolis, Ind.
Foxboro Co, 38 Neponset Ave, Foxboro, Mass.
Friez, Julien P & Sons, 4 N Central Ave, Baltimore, Md.
Huyette, Paul B, Co, Inc, 403 N Broad St, Phila, Pa.
Adv page 144
Jerguson Gage & Valve Co, Somerville, N. J.
Johnston & Jennings Co, 878 Addison Rd, Cleveland, Ohio
Adv page 47
Keckley, O C, Co, 400 W Madison St, Chicago, Ill.
Klingerit, Inc, 16 Hudson St, New York, N. Y.
Adv page 279
Liquidometer Corp, 3616 Skillman Ave, Long Island City, N. Y.
Lonergan, J E, Co, 211 Race St, Philadelphia, Pa.
Adv page 281
Lunkenheimer Co, Box 360, Annex Station, Cincinnati, Ohio
Adv pages 221, 240, 275, 276, 278, 279, 280
McNeill, T W, Engrg Equipt Co, 4059 W Van Buren St, Chicago, Ill.
Mason-Neilan Regulator Co, 1186 Adams St, Boston, Mass.
Morey & Jones, Ltd, 922 S Hemlock St, Los Angeles, Calif.
Nathan Mfg Co, 250 Park Ave, New York, N. Y.
Photoswitch Inc, 21 Chestnut St, Cambridge, Mass.
Pierce Butler Radiator Co, 701 Nichols Ave, Syracuse, N. Y.
Plouff Co, 1150 Columbus Ave, Boston, Mass.
Powell, Wm, Co, Cincinnati, O.
Adv pages 166, 167
Reliance Gauge Column Co, 5902 Carnegie Ave, Cleveland, Ohio
Adv pages 52, 53
Republic Flow Meters Co, 2222 Diversey Pkwy, Chicago, Ill.
Adv pages 215, 221, 241, 280
Schutte & Koerting Co, 12th Thompson Sts, Phila, Pa.
Shand & Jurs Co, Carlton St, Berkeley, Calif.
Simplex Valve & Meter Co, 6780 Upland St, Philadelphia, Pa.
Swift Lubricator Co, 330 James Bldg, Elmira, N. Y.
Tagliabue, C J, Mfg Co, Park & Nostrand Aves, Brooklyn, N. Y.
Taylor Instrument Cos, Rochester, N. Y.
Uehling Instrument Co, 470 Getty Ave, Paterson, N. J.
Vogt, Henry, Machine Co, 1000 W Ormsby St, Louisville, Ky.
Adv page 46
Wright-Austin Co, Detroit, Mich.
Williams Gauge Co, 1620 Pennsylvania Ave, N S, Pittsburgh, Pa.
Adv page 274
Yarnall-Waring Co, Chestnut Hill, Philadelphia, Pa.
Adv page 109

GAGES, PRESSURE
Alemite Div, 1826 W Diversey Pkwy, Chicago, Ill.
American Meter Co, Inc, 60 E 42nd St, New York, N. Y.
Ashton Valve Co, 165 1st St, Cambridge, Mass.
Bacharach Industrial Inst Co, 7000 Bennett, Pittsburgh, Pa.
Adv page 289
Bailey Meter Co, 1036 Ivanhoe Rd, Cleveland, Ohio
Adv pages 14, 15
Bastian-Blessing Co, 4201 Peterson Ave, Chicago, Ill.
Bristol Co, Waterbury, Conn.
Brown Instrument Co, 4490 Wayne Ave, Philadelphia, Pa.
Adv pages 51, 240, 254, 258, 266
Certified Gauge & Instrument Corp, Long Island City, N. Y.
Clark, Chas J, Blast Meter Co, Gladbrook, Iowa
Crosby Steam Gage & Valve Co, 40 Church St, New York, N. Y.
Defender Automatic Regulator Co, St Louis, Mo.
Esterline-Angus Co, Box 596, Indianapolis, Ind.
Foxboro Co, 38 Neponset Ave, Foxboro, Mass.
Hotstream Heater Co, Cleveland, Ohio
Liquid Carbonic Corp, 3100 Kedzie St, Chicago, Ill.
Logansport Machine, Inc, 914 Cotner Rd, Logansport, Ind.
Lonergan, J E, Co, Race St, Philadelphia, Pa.
Adv page 281
Manning, Maxwell & Moore, Inc, Bridgeport, Conn.
Marsh, Jas P, Corp, 2049 Southport Ave, Chicago, Ill.
Mason-Neilan Regulator Co, 1186 Adams St, Boston, Mass.
Mercoid Corp, 4229 Belmont Ave, Chicago, Ill.
Meriam Co, W 112th St, Cleveland, Ohio
Pierce Butler Radiator Co, 701 Nichols Ave, Syracuse, N. Y.
Plouff Co, 1150 Columbus Ave, Boston, Mass.
Republic Flow Meters Co, 2222 Diversey Pkwy, Chicago, Ill.
Adv pages 215, 221, 241, 280
Star Brass Mfg Co, 110 E Dedham St, Boston, Mass.
Tagliabue, C J, Mfg Co, Park & Nostrand, Brooklyn, N. Y.
Taylor Instrument Cos, Rochester, N. Y.
Trane Co, 2012 Cameron Ave, La Crosse, Wis.
Triplex Htg Specialty Co, Peru, Ind.
Uehling Instrument Co, 470 Getty Ave, Paterson, N. J.
U. S. Gauge Co, 44 Beaver St, New York, N. Y.
Adv page 227
Wheelco Instruments Co, 863 W Harrison St, Chicago, Ill.
Adv pages 203, 216, 254, 258
York Ice Machy Corp, York, Pa.

GAS, ACETYLENE, OXYGEN
(See Welding)

GAS, AMMONIA
Bower, Henry, Chemical Mfg Co, Philadelphia, Pa.
duPont de Nemours, E I, Co, National Ammonia Div, Phila, Pa.
Mathieson Alkali Works, Inc, 60 E 42nd St, New York, N. Y.
Michigan Alkali Co, 60 E 42nd St, New York, N. Y.
Pennsylvania Salt Mfg Co, 1000 Widener Bldg, Philadelphia, Pa.
York Ice Machy Corp, York, Pa.

GAS, CARBON-DIOXIDE
Liquid Carbonic Co, Chicago, Ill.
Pure Carbonic Inc, 60 E 42nd St, New York, N. Y.

GAS DETECTORS
(See Detectors, Gas)

GAS, FREON
Kinetic Chemicals Inc, Wilmington, Del.
Virginia Smelting Co, West Norfolk, Va.

GAS, METHYL-CHLORIDE
Ansul Chemical Co, Marinette, Wis.
duPont de Nemours, E I, & Co, R & H Chemicals Div, Wilmington, Del.
Virginia Smelting Co, West Norfolk, Va.

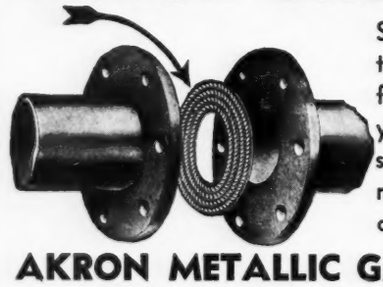
GAS ANALYZERS
(See Analyzers, CO_2, Portable, and Recorders, CO_2)

GAS BURNERS
(See Burners, Gas)

GAS COMPRESSORS
(See Compressors, Air, Gas)

GASKETS
Akron Metallic Gasket Co, 160 N Union St, Akron, Ohio.
Adv page 228
Alpha Metal & Rolling Mill, Inc, 363 Hudson Ave, Brooklyn, N. Y.
American Felt Co, 315 4th Ave, New York, N. Y.
Anchor Packing Co, 401 N Broad St, Philadelphia, Pa.
Armstrong Cork Co, Industrial Div, Lancaster, Pa.
Adv page 218
Belmont Packing & Rubber Co, Philadelphia, Pa.

AKRON GASKETS



Serving the Industries continuously for the past 35 years under the same management. Perhaps we can help you.

AKRON METALLIC GASKET CO.
162 N. UNION ST. AKRON, OHIO

Booth Felt Co, 455 19th St, Brooklyn, N. Y.
Chicago Wilcox Mfg Co, 7701 Avalon Ave, Chicago, Ill.
Cincinnati Gasket & Packing Co, Elm St, Cincinnati, Ohio
Continental Rubber Works, Erie, Pa.
Adv page 109
Crane Packing Co, 1801 Cuyler Ave, Chicago, Ill.
Darcoid Co, Inc, 145 6th Ave, New York, N. Y.
Detroit Gasket & Mfg Co, 12640 Burt Rd, Detroit, Mich.
Durabla Mfg Co, Room 202, 114 Liberty St, New York, N. Y.
Ehret Magnesia Mfg Co, Inc, Valley Forge, Pa.
Adv page 157
Endura Mfg Corp, Quakertown, Pa.
Ernst Water Column & Gage Co, Livingston, N. J.
Adv page 150
Eureka Packing Co, 294-296 46th St, Brooklyn, N. Y.
Excelsior Leather Washer Mfg Co, Rockford, Ill.
Felters Co, Inc, Dept LM, 210 South St, Boston, Mass.
Fitzgerald Mfg Co, Torrington, Conn.
Flexitallic Gasket Co, Camden, N. J.
Garlock Packing Co, 400 Main St, Palmyra, N. Y.
Adv page 42
Goetze Gasket & Packing Co, 10 Allen Av, New Brunswick, N. J.
Houghton, E F, & Co, 244–256 W Somerset St, Phila, Pa.
Jenkins Bros, 80 White St, New York, N. Y.
Johns-Manville, 22 E 40th St, New York, N. Y.
Adv pages 44, 45
Johnson, Henry, Co, Jersey City, N. J.
Keasbey & Mattison Co, Butler Pike, Ambler, Pa.
Adv page 137
Klingerit, Inc, 16 Hudson St, New York, N. Y.
Adv page 279
Limbert, Geo B, & Co, 570 Fulton St, Chicago, Ill.
Linear Packing & Rubber Co, State & Levick St, Phila, Pa.
McCord Radiator Mfg Co, Detroit, Mich.
Manhattan Rubber Mfg Div, 94 Townsend St, Passaic, N. J.
Melrath Supply & Gasket Co, Tioga and Memphis Sts, Philadelphia, Pa.
Metallo Gasket Co, French St, New Brunswick, N. J.
National Lead Co, 111 Broadway, New York, N. Y.
National Vulcanized Fibre Co, Wilmington, Del.
Phoenix Specialty Mfg Co, 155 Wooster St, New York, N. Y.
Quaker Rubber Corp, Comly & Milnor Sts, Phila, Pa.
Robinson, John R, 354 W 31st St, New York, N. Y.
Savage Packing & Engrg Co, 1029 Clinton, Hoboken, N. J.
Schieren, Chas A, Co, 30–39 Ferry St, New York, N. Y.
Sexauer, J A Mfg Co, 2503 Third Avenue, New York, N. Y.
Smooth-On Mfg Co, D-30 572 Communipaw Ave, Jersey City, N. J.
Steel Improvement & Forge Co, Addison Rd, Cleveland, Ohio
Thermoid Rubber Div, Whitehead Rd, Trenton, N. J.
Union Asbestos & Rubber Co, 1821 So 54th Ave, Cicero, Ill.
Adv pages 204, 238, 248, 273
U. S. Indestructible Gasket & Mfg Co, 829 E 15th St, Brooklyn, N. Y.
U. S. Rubber Co, 1230 6th Ave, New York, N. Y.
Vellumoid Co, 54 Rockdale St, Worcester, Mass.
Victor Mfg & Gasket Co, 5750 Roosevelt Rd, Chicago, Ill.
Weston Packing, Goshen, Ind.
Wilmington Fibre Specialty Co, Wilmington, Del.

GATE VALVES

(See Valves, Gate)

GEAR UNITS, POWER-TRANSMISSION

Abart Gear & Machine Co, 4828 W 16th St, Chicago, Ill.
Allis-Chalmers Mfg Co, Milwaukee, Wis.
Adv pages 6, 7
American Pulley Co, 4200 Wissahickon Ave, Philadelphia, Pa.
Atlantic Gear Works, Inc, 198 Lafayette St, New York, N. Y.
Bond, Charles, Co, 617-623 Arch St, Philadelphia, Pa.
Boston Gear Works, Inc, North Quincy, Mass.
Chain Belt Co, 1674 W Bruce St, Milwaukee, Wis.
Cleveland Worm & Gear Co, Cleveland, Ohio
De Laval Steam Turbine Co, Trenton, N. J.
Adv page 58
Falk Corp, 3104 W Canal St, Milwaukee, Wis.
Farrel-Birmingham Co, Inc, 344 Vulcan St, Buffalo, N. Y.
Foote Bros Gear & Machine Co, S Western Blvd, Chicago, Ill.
Adv page 163
General Electric Co, Schenectady, N. Y.
Adv pages 32, 33
Hill Acme Co, 6400 Breakwater Ave, Cleveland, Ohio
Horsburgh & Scott Co, Cleveland, Ohio
Janette Mfg Co, 556 W Monroe St, Chicago, Ill.
Jones, W A, Foundry & Machine Co, 4423 W Roosevelt Rd, Chicago, Ill.
Link-Belt Co, 2045 W Hunting Park Ave, Philadelphia, Pa.
Adv page 3
McNally Pittsburg Mfg Co, Pittsburg, Kans.
Marley Co, Fairfax Rd & Marley Ave, Kansas City, Kan.
Adv page 268
Merkle-Korff Gear Co, 216 N Morgan St, Chicago, Ill.
Mesta Machine Co, P O Box 1466, Pittsburgh, Pa.
Michigan Tool Co, 7171 E McNichols Rd, Detroit, Mich.
Moore Steam Turbine Div, Worthington Pump & Machinery Corp, Wellsville, N. Y.
Morrison Machine Co, Paterson, N. J.
Palmer-Bee Co, Detroit, Mich.
Philadelphia Gear Works, Erie Ave & G St, Philadelphia, Pa.
Adv page 57
Pittsburgh Gear & Machine Co, Pittsburgh, Pa.
Poole Foundry & Machine Co, Baltimore, Md.
Precision Development Co, College Ave, Salisbury, Md.
Smith, Winfield H, 330 West St, Springville, N. Y.
Stephens-Adamson Mfg Co, 5 Ridgeway Ave, Aurora, Ill.
Adv page 175
Sterling Electric Motors Inc, Los Angeles, Calif.
Sturtevant, B F, Co, 47 Readville St, Boston, Mass.
Terry Steam Turbine Co, Box 1200, Hartford, Conn.
Adv page 54
Twin Disc Clutch Co, Racine, Wis.
U S Electrical Motors Inc, 200 E Slauson Ave, Los Angeles, Calif.
Universal Gear Corp, 1452 E 19th St, Indianapolis, Ind.
Waldron, John, Corp, Box 110, New Brunswick, N. J.
Watson-Flagg Machine Co, Paterson, N. J.
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61

GENERATORS, ENGINE-TYPE

Allis-Chalmers Mfg Co, Milwaukee, Wis.
Adv pages 6, 7
Bardco Mfg & Sales Co, 3725 Wilshire Blvd, Los Angeles, Calif.
Bogue Electric Co, 80 Glover Ave, Paterson, N. J.
Caterpillar Tractor Co, Peoria, Ill.
Century Electric Co, 1806 Pine St, St Louis, Mo.
Columbia Electric Mfg Co, 4519 Hamilton Ave, Cleveland, Ohio
Crocker-Wheeler Electric Mfg Co, Ampere, N. J.
Electric Machinery Mfg Co, Minneapolis, Minn.
Elliott Co, Jeannette, Pa.
Adv pages 4, 5, 187
Fairbanks, Morse & Co, 600 S Michigan Ave, Chicago, Ill.
Adv page 170
General Electric Co, Schenectady, N. Y.
Adv pages 32, 33
Hill Diesel Engine Co, Lansing, Mich.
Le Roi Co, Milwaukee, Wis.
Murphy Diesel Co, 5317 W Burnham St, Milwaukee, Wis.
Novo Engine Co, 1 Porter St, Lansing, Mich.
Sturtevant, B F, Co, 47 Readville St, Boston, Mass.
Adv pages 40, 41
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61

GENERATORS, TURBO-

Allis-Chalmers Mfg Co, Milwaukee, Wis.
Adv pages 6, 7
Century Electric Co, 1806 Pine St, St Louis, Mo.
Crocker-Wheeler Elec Mfg Co, Ampere, N. J.
De Laval Steam Turbine Co, Trenton, N. J.
Adv page 58
Elliott Co, Jeannette, Pa.
Adv pages 4, 5, 187
Fairbanks, Morse & Co, 600 S Michigan Ave, Chicago, Ill.
Adv page 170
General Electric Co, Schenectady, N. Y.
Adv pages 32, 33
Moore Steam Turbine Div—Worthington Pump & Machinery Corp, Wellesville, N. Y.
Terry Steam Turbine Co, Box 1200, Hartford, Conn.
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61

GENERATOR SETS, GAS-, OIL-ENGINE, SELF-CONTAINED

Atlas-Imperial Diesel Engine Co, 1000 19th Ave, Oakland, Calif.
Bardco Mfg & Sales Co, 3725 Wilshire Blvd, Los Angeles, Cal.
Bogue Electric Co, 80 Glover Avenue, Paterson, N. J.
Buda Co, Harvey, Ill.
Caterpillar Tractor Co, Peoria, Ill.
Century Electric Co, 1806 Pine St, St Louis, Mo.
Climax Engineering Co, 1003 Allen Bldg, Dallas, Tex.
Fairbanks, Morse & Co, 600 S Michigan Ave, Chicago, Ill.
Adv page 170
Ingersoll-Rand Co, 11 Broadway, New York, N. Y.
Adv pages 168, 169
Lister-Blackstone, Inc, 1706 S 68th St, Milwaukee, Wis.
Lorimer Diesel Engine Co, 16th and Wood Sts, Oakland, Cal.
Mall Tool Co, 7740 S Chicago Ave, Chicago, Ill.
Menasco Mfg Co, 805 S San Fernando Blvd, Burbank, Calif.
Murphy Diesel Co, 5317 W Burnham St, Milwaukee, Wis.
Nordberg Mfg Co, 3073 S Chase Ave, Milwaukee, Wis.
Novo Engine Co, 1 Porter St, Lansing, Mich.
Ready Power Co, 4433 Cass Ave, Detroit, Mich.
Sheppard, R H, Co, Hanover, Pa.
Union Diesel Engine Co, 2200 E 7th St, Oakland, Calif.
Weber Engine Co, 12th & Winchester St, Kansas City, Mo.
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61

GLASS TUBING

(See Tubing, Glass)

GLASSES, GAGE

Chesterton, A W, Co, 64 India St, Boston, Mass.
Cincinnati Gasket & Packing Co, Elm St, Cincinnati, Ohio
Corning Glass Works, Dept IP, Corning, N. Y.
Diamond Power Specialty Corp, Box 288, Detroit, Mich.
Adv pages 116, 117
Durabla Mfg Co, Room 202, 114 Liberty St, New York, N. Y.
Ernst Water Column & Gage Co, Livingston, N. J.
Adv page 150
Huyette, Paul B, Co, Inc, 403 N Broad St, Philadelphia, Pa.
Adv page 144
Jerguson Gage & Valve Co, Somerville, Mass.
Klingerit, Inc, 16 Hudson St, New York, N. Y.
Adv page 279
Lunkenheimer Co, Box 360, Annex Station, Cincinnati, O.
Adv pages 221, 240, 275, 276, 278, 279, 280
Nathan Mfg Co, 250 Park Ave, New York, N. Y.
National Lead Co, 111 Broadway, New York, N. Y.
Powell, Wm, Co, Cincinnati, Ohio
Adv pages 166, 167
Swift Lubricator Co, 330 James Bldg, Elmira, N. Y.
Yarnall-Waring Co, Chestnut Hill, Philadelphia, Pa.
Adv page 109

GLOBE VALVES

(See Valves, Globe)

GLOVES, ASBESTOS

American Optical Co, Southbridge, Mass.
Darcoid Co, 145 6th Ave, New York, N. Y.
Eimer & Amend, 635 Greenwich St, New York, N. Y.
Johns-Manville, 22 E 40 St, New York, N. Y.
Adv pages 44, 45
Keasbey & Mattison Co, Butler Pike, Ambler, Pa.
Adv page 137
Linde Air Products Co, 30 E 42nd St, New York, N. Y.
Adv pages 36, 37
Pulmosan Safety Equipment, 176 John St, Brooklyn, N. Y.

GLOVES, RUBBER

Eimer & Amend, 635 Greenwich St, New York, N. Y.
Goodrich, B F, Co, 460 S Main St, Akron, Ohio
Pulmosan Safety Equipment, 176 John St, Brooklyn, N. Y.
U. S. Rubber Co, 1230 6th Ave, New York, N. Y.

GOVERNORS, AIR-COMPRESSOR

Foster Engrg Co, 109 Monroe St, Newark, N. J.
Adv pages 230, 257, 259, 276
Adv pages 210, 234, 253, 254a
Gardner-Denver Co, Quincy, Ill.
General Controls Co, 810 Allen Ave, Glendale, Calif.
General Electric Co, Schenectady, N. Y.
Adv pages 32, 33
Grove Regulator Co, 1190 67th St, Oakland, Calif.
Hagan Corp, Hagan Bldg, Pittsburgh, Pa.
Adv pages 30, 31
Jarecki Mfg Co, Erie, Pa.
Schade Valve Mfg Co, 2527 N Bodine St, Philadelphia, Pa.
Westinghouse Air Brake Co, Wilmerding, Pa.

GOVERNORS, ENGINE, INTERNAL-COMBUSTION

Grove Regulator Co, 1190 67th St, Oakland, Calif.
King-Seeley Corp, Ann Arbor, Mich.
Massey Machine Co, 789 Pearl St, Watertown, N. Y.
Pickering Governor Co, Dept M, Portland, Conn.
Pierce Governor Company, 1611 Ohio Ave, Anderson, Indiana.
Strong, Carlisle & Hammond Co, 1392 W 3rd St, Cleveland, Ohio
Adv page 285
Woodward Governor Co, Rockford, Ill.

GOVERNORS, ENGINE, STEAM

Askania Regulator Co, S Michigan Ave, Chicago, Ill.
Filer & Stowell Co, 147 E Becher St, Milwaukee, Wis.
Gardner-Denver Co, 100 Gardner Drive, Quincy, Ill.
Grove Regulator Co, 1729 Poplar St, Oakland, Calif.
Mason-Neilan Regulator Co, 1186 Adams St, Boston, Mass.
Massey Machine Co, 789 Pearl St, Watertown, N. Y.
Pickering Governor Co, Dept M, Portland, Conn.
Strong, Carlisle & Hammond Co, 1392 W 3rd St, Cleveland, Ohio
Adv page 285

Get BATES-GRATES

FOR YOUR OPEN STEEL FLOORING

See that scraper tread—and the crisp lines of the Hex cross bar? *That* gives a safer and cleaner tread and at the bottom of those cross bars you find clean, well-shaped fillets made by the metal displaced in the Bates patented process—no metal is lost. The weld is cleaner and stronger. The *floor* is cleaner and stronger. Yet, open steel flooring made under Bates patents costs no more.

WALTER BATES COMPANY, INC.
208 S. LA SALLE STREET • CHICAGO, ILLINOIS
OPEN STEEL FLOORING • STAIR TREADS

Waters Governor Co, 1123 Oliver Bldg, Boston, Mass.
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61
Woodward Governor Co, Rockford, Ill.

GOVERNORS, PUMP

Atlas Valve Co, 289 South St, Newark, N. J.
Adv page 281
Bailey Meter Co, 1036 Ivanhoe Rd, Cleveland, Ohio
Adv pages 14, 15
Cash, A W, Co, 402 N Eldorado St, Decatur, Ill.
Chaplin-Fulton Mfg Co, 28-40 Penn Ave, Pittsburgh, Pa.
Davis Regulator Co, 2540 S, Washtenaw Ave, Chicago, Ill.
Defender Automatic Regulator Co, St. Louis, Mo.
Dunham, C A, Co, 450 E Ohio St, Chicago, Ill.
Fisher Governor Co, 203 S 1st **Ave, Marshalltown, Iowa**
Foster Engrg Co, 109 Monroe St, Newark, N. J.
Adv pages 230, 257, 259, 276
Gardner-Denver Co, 100 Gardner Drive, Quincy, Ill.
General Controls Co, 810 Allen Ave, Glendale, Calif.
Grove Regulator Co, 1190 67th St, Oakland, Calif.
Hagan Corp, Hagan Bldg, Pittsburgh, Pa.
Adv pages 30, 31
Illinois Engrg Co, Racine Ave, & 21st St, Chicago Ill.
Jarecki Mfg Co, Erie, Pa.
Keckley, O C, Co, 400 W Madison St, Chicago, Ill.
Kieley & Mueller, Inc, 2015-2033 43rd St, N Bergen, N. J.
Kitts Steam Specialty Co, 270 W Second St, Oswego, N. Y.
Klipfel Mfg Co, 2651 W Harrison St, Chicago, Ill.
Leahy Mfg Co, E 8th St, Los Angeles, Calif.
Leslie Co, Lyndhurst, N. J.
McAlear Mfg Co, Chicago, Ill.
Mason-Neilan Regulator Co, 1186 Adams St, Boston, Mass.
Mercon Regulator Co, 2357 N 29th St, Milwaukee, Wis.
Northern Equipment Co, 1221 Grove Drive, Erie, Pa.
Adv page 119
Plouff Co, 1150 Columbus Ave, Boston, Mass.
Reading, Pratt & Cady Div, Reading, Pa.
Adv pages 176, 177
Ruggles-Klingemann Mfg Co, Salem, Mass.
Schade Valve Mfg Co, 2527 N Bodine St, Chicago, Ill.
Spence Engrg Co, Inc, 61 Grant St, Walden, N. Y.
Squires, C E, Co, 40th St & Kelley Ave, Cleveland, Ohio
Adv page 283
Staples & Pfeiffer, Ltd, 528 Bryant St, San Francisco, Cal.
Strong, Carlisle & Hammond Co, 1392 W 3rd St, Cleveland, Ohio
Adv page 285
Swartwout Co, 18511 Euclid Ave, Cleveland, Ohio
Adv page 312
Waters Governor Co, 1123 Oliver Bldg, Boston, Mass.
Watts Regulator Co, Lawrence, Mass.
Williams Gauge Co, 1938 Pennsylvania Ave, N S, Pittsburgh, Pa.
Adv page 274
Wright-Austin Co, Detroit, Mich.

GOVERNORS, STEAM-TURBINE

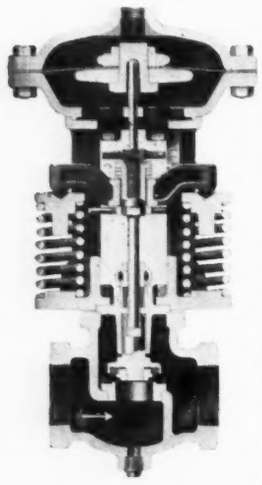
Askania Regulator Co, 16th Street & S Michigan Ave, Chicago, Ill.
Cash, A W, Co, 402 N Eldorado St, Decatur, Ill.
De Laval Steam Turbine Co, Trenton, N. J.
Adv page 58
General Electric Co, Schenectady, N. Y.
Adv pages 32, 33
Hagan Corp, Hagan Bldg, Pittsburgh, Pa.
Adv pages 30, 31
Keckley, O C, Co, 400 W Madison St, Chicago, Ill.

FOSTER PUMP GOVERNORS

There is a Foster Pump Governor for every service . . . for boiler-feed or differential-pressure pumps; for constant-pressure pumps, either reciprocating or turbine-driven, for handling water, oil, or chemicals; for fire pumps, blowers, compressors, and for vacuum service.

Whether for constant, intermittent, or standby service, each type is designed for accurate and dependable regulation throughout years of service. Each type is so constructed that repairs and replacements are reduced to an absolute minimum. All have wide pressure-adjustment ranges . . . all are easy to adjust. All can be installed in any position, but a vertical position is recommended.

The Foster Engineering Company also manufactures special adjustment devices for the rapid change of discharge pressure setting. Complete information on both the pulsation eliminator and on the discharge pressure setting device will be furnished on request.



Type 37-P2

Type of Service	Type of Valve and Sizes	Materials of Construction	Initial Pressure and Temperature Range	Discharge Pressure Rating and Type	Differential Pressure Rating and Type
EXCESS PRESSURE SERVICE lower differential pressure ranges Boiler Feed Pumps	37-P ½–4 in.	Semi-Steel Bronze Trim	250 lbs. 475° F.		10 to 110 lbs. Diaphragm Type 50 to 150 lbs. Diaphragm Type
		Cast Steel Body Special Alloy Trim	300–400–600 lbs. 750° F.		
higher differential pressure ranges	37-P1 ½–4 in.	Semi-Steel Bronze Trim	250 lbs. 475° F.		100–300 lbs. Piston Type
		Cast Steel Body Special Alloy Trim	300–400–600 lbs. 750° F.		100–300 lbs. Piston Type
CONSTANT PRESSURE SERVICE lower discharge pressure ranges Fuel Oil Pumps Lube Oil Pumps Water Pumps Compressors	37-P2 ½–4 in.	Semi-Steel Bronze Trim	250 lbs. 475° F.	3–110 lbs. Diaphragm Type	
		Cast Steel Body Special Alloy Trim	300–400–600 lbs. 750° F.		
higher discharge pressure ranges not dead-end service Storage Tank Pumps	37-P3 ½–4 in.	Semi-Steel Bronze Trim	250 lbs. 475° F.	100–500 lbs. Piston Type	
		Cast Steel Body Special Alloy Trim	300–400–600 lbs. 750° F.		
differential or delayed action dead-end service	38-P4 ½–4 in.	Semi-Steel or Bronze Body with Bronze Trim	250 lbs. 475° F.	10–200 lbs. Diaphragm Type Auxiliary Operated	
		Cast Steel Body Special Alloy Trim	300–400–600 lbs. 750° F.		
closer regulation than with Types 37-P2 or P3 on widely and rapidly varying loads dead-end service FIRE PUMPS FUEL OIL PUMPS discharge above 100 lb.	38-P6 ½–4 in.	Semi-Steel or Bronze Body with Bronze Trim	250 lbs. 475° F.	10–800 lbs. Diaphragm Type Auxiliary Operated	
		Cast Steel Body Special Alloy Trim	300–400–600 lbs. 750° F.		
VACUUM SERVICE Vacuum Pumps	39-P10 ½–2 in.	Semi-Steel Bronze Trim	250 lbs. 475° F.	1 to 28 in. Hg. Vacuum Diaphragm Type	

A new complete catalog will be sent to executives and engineers engaged in those industries serving national defense if the request is written on their company's letterhead.

FOSTER ENGINEERING COMPANY

106 MONROE STREET ***Manufacturers of a Complete Line of Automatic Valves*** **NEWARK, N. J.**

12-FE-1

Massey Machine Co, 789 Pearl St, Watertown, N. Y.
Pickering Governor Co, Dept M, Portland, Conn.
Terry Steam Turbine Co, Box 1200, Hartford, Conn.
Adv page 54
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61
Woodward Governor Co, Rockford, Ill.

GOVERNORS, WATER-WHEEL

Allis-Chalmers Mfg Co, Milwaukee, Wis.
Adv pages 6, 7
Baldwin-Southwark Div, Baldwin Locomotive Works, Paschall P O, Philadelphia, Pa.
Lombard Governor Co, Ashland, Mass.
Pelton Water Wheel Co, San Francisco, Calif.
Smith, S Morgan, Co, 500 Lincoln St, York, Pa.
Woodward Governor Co, Rockford, Ill.

GRAPHITE, LUBRICATING

Acheson Colloids Corp, 3000 Washington, Port Huron, Mich.
Dixon, Joseph, Crucible Co, 170 Wayne St, Jersey City, N. J.
Adv pages 186
Ilsley, Doubleday & Co, 56-14 Nurge Ave, Maspeth, N. Y.
U. S. Graphite Co, Holland St, Saginaw, Mich.

GRATES

American Coal Burner Co, 155 E Superior St, Chicago, Ill.
Adv page 264
Babcock & Wilcox Co, 85 Liberty St, New York, N. Y.
Adv pages 8, 9, 10, 11
Bass Foundry & Machine Div, 1602 Hanna St, Fort Wayne, Ind.
Brownell Co, 301 N Findlay St, Dayton, Ohio
Canton Stoker Corp, 741 Andrew Pl, Canton, Ohio.
Combustion Engrg Co, Inc, 205 Madison Ave, New York, N. Y.
Adv pages 16, 17
Godfrey Keeler Co, Inc, 77 Warren St, New York, N. Y.
Hulson Grate Co, Keokuk, Iowa
International Engrg Works, Inc, Framingham, Mass.
Keeler, E, Co, Williamsport, Pa.
Adv page 125
Koppers Co, Pittsburgh, Pa.
Kramer Bros Foundry Co, Dayton, Ohio
Marion Machine, Foundry & Supply Co, Marion, Ind.
McClave Co, 751 Mill St, Allentown, Pa.
Meehanite Metal Corp, Dept A, 311 Ross St, Pittsburgh, Pa.
Milwaukee Boiler Mfg Co, 1101 S 14th St, Milwaukee, Wis.
Murray Iron Works Co, Burlington, Iowa
Adv page 148
New England Boiler Grate Co, Indian Orchard, Mass.
Nute, McGehee, Geary Co, Inc, Chambersburg, Pa.
Perfection Grate & Stoker Co, Springfield, Mass.
Springfield Boiler Co, Springfield, Ill.
Adv pages 28, 29
Stearns-Roger Mfg Co, Denver, Colo.
Thomas Foundries, Inc, Birmingham, Ala.
Titusville Iron Works Co, Titusville, Pa.
Webster, Howard J, Green & Hortter Sts, Phila, Pa.
Wickes Boiler Co, 515 N Washington Ave, Saginaw, Mich.

GRATING, FLOOR

Arrowhead Iron Works, Kansas City, Mo.
Bates, Walter, Co, 208 S La Salle St, Chicago, Ill.
Adv page 230
Blaw-Knox Co, Pittsburgh, Pa.
Adv pages 24, 25
Carnegie-Illinois Steel Co, Pittsburgh, Pa.
Gifford-Wood Co, 24 Hill St, Hudson, N. Y.
Goldens' Foundry & Machine Co, Columbus, Ga.
Hendrick Mfg Co, Carbondale, Pa.
Irving Subway Grating Co, 50-09 27th, Long Island City, N. Y.
Kerlow Steel Flooring Co, 240 Culver Ave, Jersey City, N. J.
Klemp, Wm F, Co, 6651 S Melvina Ave, Chicago, Ill.
Meehanite Corp, Dept A, 311 Ross St, Pittsburgh, Pa.
Tri-Lok Co, 5515 Butler St, Pittsburgh, Pa.

GREASE

Alemite Div, Stewart Warner Corp, 1826-1852 Diversey Pkwy, Chicago, Ill.
Borne Scrymser Co, 632 S Front St, Elizabeth, N. J.
Chard & Howe, 56-14 Nurge Ave, Maspeth, N. Y.
Cities Service Oil Co, 60 Wall Tower, New York, N. Y.
Cook's, Adam, Sons, 5 Stiles St, Linden, N. J.
Cyclone Grate Bar Co, Buffalo, N. Y.
Franklin Oil & Gas Co, Bedford, Ohio
Galena Oil Corp., 547 E 5th St, Cincinnati, Ohio.
Gulf Oil Corp, Gulf Building, Pittsburgh, Pa.
Adv page 143
Harris, A W, Oil Co, P O Box 1295, Providence, R. I.
Houghton, E F, & Co, 244-50 W Somerset St, Phila, Pa.
Hulburt Oil & Grease Co, Philadelphia, Pa.
Ilsley, Doubleday & Co, 56-14 Nurge Ave, Maspeth, Queens, N. Y.
Ironsides Co, 270 W Mound St, Columbus, Ohio
Kellogg, E H, & Co, 93 Water St, New York, N. Y.
Keystone Lubricating Co, 21st & Clearfield, Phila, Pa.
Lubriplate Div, 129 Lockwood St, Newark, N. J.
Macmillan Petroleum Corp, 530 W 6th St, Los Angeles, Calif.
Metalene Chemical Co, Bedford, Ohio.
N. Y. & N. J. Lubricant Co, 292 Madison Ave, New York, N. Y.
Ohio Grease Co, Loudonville, O.
Pennzoil Co, Oil City, Pa.
Pure Oil Co, Chicago, Ill.
Shell Oil Co, 50 W 50th St, New York, N. Y.
Adv page 131
Sinclair Refining Co, 630 5th Ave, New York, N. Y.
Adv page 149
Socony-Vacuum Oil Co, Inc, 26 Broadway, New York, N. Y.
Standard Oil of Calif, 225 Bush St, San Francisco, Calif.
Standard Oil Co, Ind, 910 S Michigan Ave, Chicago, Ill.
Standard Oil Co of N. J., 26 Broadway, New York, N. Y.
Stewart-Warner Corp, 1826 W Diversey Pkwy, Chicago, Ill.
Sun Oil Co, Philadelphia, Pa.
Adv page Third cover
Swan-Finch Oil Corp, R C A Bldg, West, New York, N. Y.
Texas Co, 135 E 42nd St, New York, N. Y.
Adv pages 48, 49
Tidewater Assoc Oil Co, 17 Battery Place, New York, N. Y.
Valvoline Oil Co, 547 E 5th St, Cincinnati, Ohio

GREASE CUPS

(See Cups, Grease)

GREASE, GRAPHITE

Acheson Colloids Corp, 3000 Washington Ave, Port Huron, Mich.
Alemite Div, Stewart Warner Corp, 1826-1852 Diversey Pkwy, Chicago, Ill.
Cook's, Adam, Sons, 5 Stiles St, Linden, N. J.
Dixon, Joseph, Crucible Co, 170 Wayne St, Jersey City, N. J.
Adv page 186
Galena Oil Corp, 547 E 5th St, Cincinnati, Ohio.
Gulf Oil Corp, Gulf Building, Pittsburgh, Pa.
Adv page 143
Harris, A W, Oil Co, Providence, R. I.
Ilsley, Doubleday & Co, 56-14 Nurge Ave, Maspeth, N. Y.
Keystone Lubricating Co, 21st & Clearfield Sts, Philadelphia, Pa.
Ohio Grease Co, Loudonville, O.
Socony-Vacuum Oil Co, 26 Broadway, New York, N. Y.
Standard Oil of Calif, 225 Bush St, San Francisco, Calif.
Standard Oil Co, Ind, 910 S Michigan Ave, Chicago, Ill.
U. S. Graphite Co, 1621 Holland Ave, Saginaw, Mich.
Valvoline Oil Co, 547 E 5th St, Cincinnati, Ohio

GREASE GUNS

(See Guns, Grease)

GREASE-REMOVING COMPOUNDS

(See Compounds)

GREASE, ROPE

Acheson Colloids Corp, 3000 Washington Ave, Port Huron, Mich.
Alemite Div, Stewart Warner Corp, 1826-1852 Diversey Pkwy, Chicago, Ill.
Chard & Howe, 56-14 Nurge Ave, Maspeth, N. Y.
Cities Service Oil Co, 60 Wall Tower, New York, N. Y.
Cook's, Adam, Sons, 5 Stiles St, Linden, N. J.
Franklin Oil & Gas Co, Bedford, Ohio
Gulf Oil Corp, Gulf Building, Pittsburgh, Pa.
Adv page 143
Ironsides Co, Columbus, Ohio
Lubriplate Div, 129 Lockwood St, Newark, N. J.
Ohio Grease Co, Loudonville, O.
Pure Oil Co, 35 East Wacker Drive, Chicago, Ill.
Adv page 245
Sinclair Refining Co, 630 5th Ave, New York, N. Y.
Adv page 149
Socony-Vacuum Oil Co, 26 Broadway, New York, N. Y.
Standard Oil of Calif, 225 Bush St, San Francisco, Calif
Standard Oil Co, Ind, 910 S Michigan Ave, Chicago, Ill.

GRILLES AND REGISTERS, HEATING, AIR CONDITIONING

Air Devices, Inc, 17 E 42nd St, New York, N. Y.
Anemostat Corp of America, 10 E 39th St, New York, N. Y.
Barber Colman Co, Rockford Ill.
Carrier Corp, Syracuse, N. Y.
Hendrick Mfg Co, Carbondale, Pa.
Independent Register Co, 3747 E 93rd St, Cleveland, Ohio
Tuttle & Bailey Inc, New Britain, Conn.
Waterloo Register Co, Waterloo, Iowa
Wickwire-Spencer Steel Co, 500 5th Ave, New York, N. Y.

GRINDERS, PNEUMATIC, ELECTRIC, PORTABLE

Black & Decker Mfg Co, Towson, Md.
Buckeye Portable Tool Co, Dayton, Ohio
Chicago Pneumatic Tool Co, 6-8 E 44th St, New York, N. Y.
Clark, Jas, Electric Co, Louisville, Ky.
Cleveland Pneumatic Tool Co, Cleveland, Ohio
Diehl Mfg Co, Elizabethport, N. J.
Dumore Co, Racine, Wis.
Graybar Electric Co, 420 Lexington Ave, New York, N. Y.
Adv pages 214, 234, 243, 261, 265, 282, 284
Helwig Mfg Co, St Paul, Minn.
Ideal Commutator Dresser Co, 1025 Park Ave, Sycamore, Ill.
Independent Pneumatic Tool Co, 600 W Jackson Blvd, Chicago, Ill.
Ingersoll-Rand Co, 11 Broadway, New York, N. Y.
Adv pages 168, 169
Madison-Kipp Corp, Madison, Wis.
Mall Tool Co, 7740 S Chicago Ave, Chicago, Ill.
Millers Falls Co, 59 Wells St, Greenfield, Mass.
Onsrud Machine Works Inc, Chicago, Ill.
Safety Grinding Wheel & Machine Co, Springfield, Ohio
Schauer Machine Co, Cincinnati, Ohio
Skilsaw Inc, 5033 Elston Ave, Chicago, Ill.
Standard Electrical Tool Co, 1918 W 8th St, Cincinnati, O.
Stanley Works, New Britain, Conn.
Stoody Co, Whittier, Cal.
Syntron Co, 492 Lexington Ave, Homer City, Pa.

GUNS, GREASE

Alemite Div, Stewart Warner Corp, 1826-1852 Diversey Pkwy, Chicago, Ill.
Lincoln Engrg Co, 5701 Natural Bridge Ave, St. Louis, Mo.
Royersford Foundry & Machine Co, Royersford, Pa.
Williams, J H, & Co, 225 Lafayette St, New York, N. Y.

GUNS, METAL-SPRAY

Master Metal Spray Co, 2527 Magnolia St, Oakland, Calif.
Metallizing Co of America, Inc, P O Box 2822, Terminal Annex, Los Angeles, Calif.
Metallizing Engrg Co, 21-07 41st Ave, Long Island City, N. Y.
Metals Coating Co of America, Philadelphia, Pa.
Metalspray Co, 113 Llewellyn St, Los Angeles, Calif.
Schori Process Corp, 8-11 43rd Rd, Long Island City, N. Y.
Turner Brass Works, Sycamore, Ind.

HAMMERS, PNEUMATIC, ELECTRIC, PORTABLE

Barco Mfg Co, 1802 Winnemac Ave, Chicago, Ill.
Black & Decker Mfg Co, Towson, Md.
Chicago Pneumatic Tool Co, 6-8 E 44th St, New York, N. Y.
Cleveland Pneumatic Tool Co, Cleveland, Ohio
Dayton Pneumatic Tool Co, 7 Norwood Ave, Dayton, Ohio
Franklin Machine Co, Providence, R. I.
Graybar Electric Co, 420 Lexington Ave, New York, N. Y.
Adv pages 214, 234, 243, 261, 265, 282, 284
Helwig Mfg Co, St Paul, Minn.
Independent Pneumatic Tool Co, 600 W Jackson Blvd, Chicago, Ill.
Ingersoll-Rand Co, 11 Broadway, New York, N. Y.
Adv pages 168, 169
Keller, William H, Inc, Grand Haven, Mich.
King Pneumatic Tool Co, N Ashland Ave, Chicago, Ill.
Madison-Kipp Corp, Madison, Wis.
Millers Falls Co, 59 Wells St, Greenfield, Mass.
Mueller Co, Decatur, Ill.
Stearns-Roger Mfg Co, Denver, Colo.
Syntron Co, 492 Lexington Ave, Homer City, Pa.

HAND CRANES

(See Cranes, Hand-Power)

HANGERS, PIPE

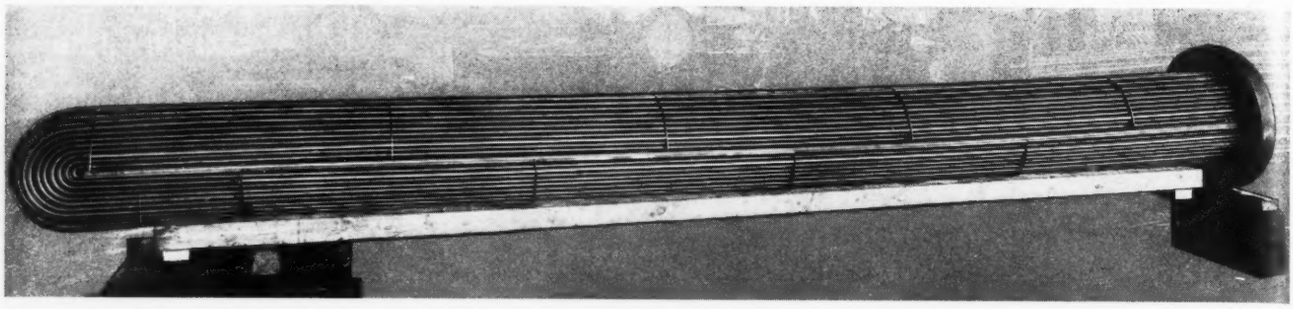
Central Automatic Sprinkler Co, 261 E Ashmead St, Phila, Pa.
Crane Co, 836 S Michigan Ave, Chicago, Ill.
Adv page 123
Grinnell Co, Inc, 277 W Exchange St, Providence, R. I.
Adv page 156
Jarecki Mfg Co, Erie, Pa.
National Valve & Mfg Co, 3102 Liberty Ave, Pittsburgh, Pa.
Adv page 200
Pittsburgh Valve & Fittings Corp, Barberton, Ohio
Power Piping Div, Blaw Knox Co, 1525 Pennsylvania Ave, Blaw Knox, Pa.
Adv pages 24, 25
Rockwood Sprinkler Co, 54 Harlow St, Worcester, Mass.
Walworth Co, Inc, 60 E 42nd St, New York, N. Y.
Adv pages 172, 173

HANGERS, SHAFT, & PILLOW BLOCKS

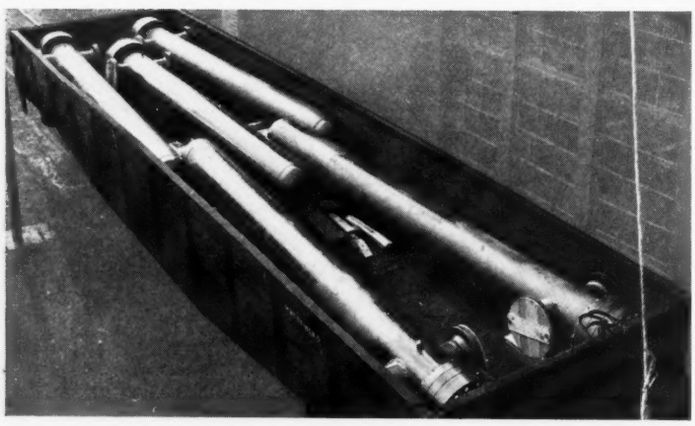
Ahlberg Bearing Co, 4732 Whipple St, Chicago, Ill.

WHITLOCK

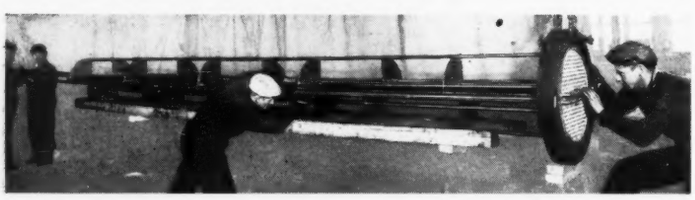
Manufacturers of Heat Transfer Equipment Since 1891!



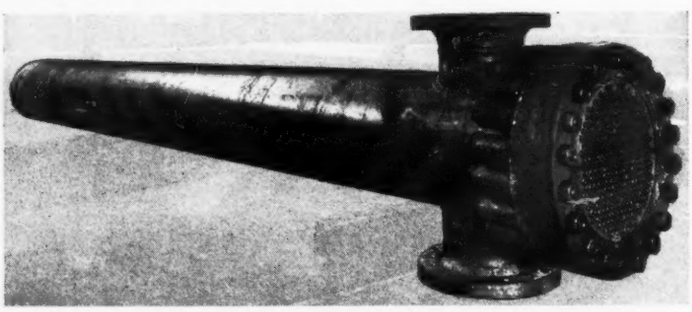
Whitlock Standard U-Tube Construction for Heat Exchangers and Extraction Feed Water Heaters Has Practical War-Time Value—Saves Material, Machining, and Assembly Time!



Complete Heat Exchangers—note welded rear end construction.



U-bends carefully "threaded" through baffle plates and tube sheet.



Tube Section in Shell—ready for pressure testing of welded shell.

For years Whitlock Heat Exchangers, Feed Water, Fuel Oil, Instantaneous, and Service Water Heaters have featured U-tube heating sections (though all types specified by customer have been and are made).

The obvious advantage of the U-tube is the elimination of trouble due to different expansion of section and shell—the U-tube section expands or contracts independent of the shell. Its resulting advantages, always important, are even more practical in war time. Materials used in alternate constructions are saved—such as floating tube sheet, floating head and rear head of shell. Valuable time used in machining these parts and in assembly is saved as making U-bends and welding shell ends takes substantially less time.

All this helps to get vital war units at work quicker; the one aim of the whole Whitlock organization. Can we help you? Write fully.

THE WHITLOCK MANUFACTURING COMPANY

46 SOUTH STREET, ELMWOOD, HARTFORD, CONN.

District Offices in

NEW YORK CHICAGO BOSTON PHILADELPHIA DETROIT RICHMOND

American Pulley Co, 4200 Wissahickon Ave, Philadelphia, Pa.
Barry Co, Muscatine, Iowa.
Bond, Charles, Co, 617-623 Arch St, Philadelphia, Pa.
Boston Gear Works, Inc, North Quincy, Mass.
Caldwell, W E, Co, 280 Brandeis St, Louisville, Ky.
Carey, W W, Co, Lowell, Mass.
Chicago Pulley & Shafting Co, Chicago, Ill.
Clizbe Bros Mfg Co, Plymouth, Ind.
Continental Gin Co, 4500 5th Ave, South, Birmingham, Ala.
Dick, R & J, Co, Passaic, N. J.
Dodge Mfg Corp, Mishawaka, Ind.
Falls Clutch & Machinery Co, Cuyahoga Falls, Ohio
Franklin Machine Co, Providence, R. I.
Goldens' Foundry & Machine Co, Columbus, Ga.
Great Western Mfg Co, Leavenworth, Kan.
H & O Machinery & Engrg Co, Euclid Ave & Esther St, Newark, N. J.
Hill Acme Co, 6400 Breakwater Ave, Cleveland, Ohio
Jeffrey Mfg Co, 932-99 N 4th St, Columbus, Ohio
Jones, W A, Foundry & Machine Co, 4423 W Roosevelt Rd, Chicago, Ill.
Link-Belt Co, 519 North Holmes Ave, Indianapolis, Ind.
Adv page 3
McNally Pittsburg Mfg Co, Pittsburg, Kansas
Medart Co, 3548 De Kalb St, St Louis, Mo.
Robins Conveying Belt Co, Passaic, N. J.
Adv page 188
Royersford Foundry & Machine Co, 75 Main, Royersford, Pa.
Sackett, A J, & Sons, Baltimore, Md.
S K F Industries, Inc, Front St & Erie Ave, Philadelphia, Pa.
Smith, Winfield H, Inc, 330 West St, Springville, Ohio
Sprout, Waldron & Co, Muncy, Pa.
Standard Pressed Steel Co, Jenkintown, Pa.
Stephens-Adamson Mfg Co, 5 Ridgeway Ave, Aurora, Ill.
Adv page 175
Wood's, T B, Sons Co, 1165 5th Ave, Chambersburg, Pa.

HEADS, EXHAUST

Atwood & Morrill Co, Salem, Mass.
Burt Mfg Co, 232 Main St, Akron, Ohio
Cochrane Corp, 3106 N 17th St, Philadelphia, Pa.
Adv pages 154, 233, 240, 261, 269
Hoppes Mfg Co, Belmont Ave, Springfield, Ohio
Illinois Engrg Co, Racine Ave & 21st St, Chicago, Ill.
Kieley & Mueller, Inc, 2015-2033 43rd St, N Bergen, N. J.
McAlear Mfg Co, Chicago, Ill.
Milwaukee Steam Appliance Co, West Allis, Wis.
Plouff Co, 1150 Columbus Ave, Boston, Mass.
Ruggles-Klingemann Mfg Co, Salem, Mass.
Sly, W W, Mfg Co, 4724 Train Ave, Cleveland, Ohio
Straight Line Foundry & Machine Corp, 218 S Geddes St, Syracuse, N. Y.
Swartwout Co, 18511 Euclid Ave, Cleveland, Ohio
Adv page 312
Wright-Austin Co, Detroit, Mich.

HEAT EXCHANGERS

Alberger Heater Co, 287 Chicago St, Buffalo, N. Y.
Alco Products Div, 36 Church St, New York, N. Y.
Adv pages 56, 155
Allis-Chalmers Mfg Co, Milwaukee, Wis.
Adv pages 6, 7
Andale Co, 1600 Arch St, Philadelphia, Pa.
Babcock & Wilcox Co, 85 Liberty St, New York, N. Y.
Adv pages 8, 9, 10, 11
Braun, C F & Co, 1000 South Fremont Ave, Alhambra, Cal.
Buffalo Forge Co, 488 Broadway, Buffalo, N. Y.
Adv page 199
California Steel Prod Co, Barrett & A Sts, Richmond, Calif.
Cochrane Corp, 3106 N 17th St, Philadelphia, Pa.
Adv pages 154, 233, 240, 261, 269
Corning Glass Works, Dept IP, Corning, N. Y.
Croll-Reynolds Engrg Co, 17 John St, New York, N. Y.
Adv pages 222, 239
Davis Engrg Corp, 1064-16 E Grand St, Elizabeth, N. J.
Devine, J P, Mfg Co, Inc, Mt Vernon, Ill.
Downington Iron Works, Downington, Pa.
Duriron Co, Inc, Dayton, Ohio
Elgin Softener Corp, 130 N Grove Ave, Elgin, Ill.
Adv page 283
Elliott Co, Jeannette, Pa.
Adv pages 4, 5, 187
Foster Wheeler Corp, 165 Broadway, New York, N. Y.
Adv pages 38, 39
Griscom-Russell Co, 285 Madison Ave, New York, N. Y.
Heilman Boiler Works, Allentown, Pa.
Henszey Co, Dept D-14 Watertown, Wis.
Ingersoll-Rand Co, 11 Broadway, New York, N. Y.
Adv pages 168, 169
Kellogg, M W, Co, Jersey City, N. J.
Adv page 161
Kopperman, Jos, & Sons, 312-16 New St, Philadelphia, Pa.
Leader Iron Works, Inc, Decatur, Ill.
Leahy Mfg Co, E 8th St, Los Angeles, Calif.
Lummus Co, 420 Lexington Ave, New York, N. Y.
Adv page 192
Madden, P E, & Co, 352 W Walton St, Chicago, Ill.
Marley Co, Fairfax Rd & Marley Ave, Kansas City, Kan.
Adv page 268
Marlo Coil Co, St Louis, Mo.
National Tube Co, Pittsburgh, Pa.
Ohio Seamless Tube Co, Shelby, Ohio
Patterson-Kelley Co, E Stroudsburg, Pa.
Prat-Daniel Corp, 80 S Water St, Port Chester, Pa.
Adv pages 212, 262
Pritchard, J F, Co, Dwight Bldg, Kansas City, Mo.
Adv page 257
Rempe Co, 340 N Sacramento Blvd, Chicago, Ill.
Richmond Engrg Co, 7th & Hospital Sts, Richmond, Va.
Rome-Turney Radiator Co, 200 Lynch St, Rome, N. Y.
Ross Heater & Mfg Co, Inc, 1407 West Ave, Buffalo, N. Y.
Scaife, Wm B, & Sons Co, River & Ann St, Oakmont, Pa.
Schubert-Christy Corp, 1600 Georgia St, Affton Station, St Louis, Mo.
Schutte & Koerting Co, 12th & Thompson Sts, Phila, Pa.
Staples & Pfeiffer Ltd, 528 Bryant St, San Francisco, Calif.
Stearns-Roger Mfg Co, Denver, Col.
Struthers-Wells Corp, Warren, Pa.
Treadwell Construction Co, Midland, Pa.
Vogt, Henry, Machine Co, 1000 W Ormsby St, Louisville, Ky.
Adv pages 60, 61
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv page 46
Wheeler, C H, Mfg Co, Lehigh & Sedgley Aves, Phila, Pa.
Whitlock Mfg Co, 77 South St, Hartford, Conn.
Adv page 232
Worthington Pump & Machinery Corp, Harrison, N. J.
Adv page 171
Yates American Machine Co, Beloit, Wis.
York Ice Machy Corp, York, Pa.
Young Radiator Co, Racine, Wis.
Zallea Bros & Johnson, 820 Locust St, Wilmington, Del.

HEAT-RESISTANT PAINTS

(See Paints, Heat-Resistant)

HEAT INSULATION

(See Insulation)

HEATERS, AIR

(See Preheaters, Air)

HEATERS, AIR, DIRECT-FIRED

Airtemp Div, Chrysler Corp, Dayton, Ohio
Campbell Heating Co, Des Moines, Iowa
Foster Wheeler Corp, 165 Broadway, New York, N. Y.
Adv pages 38, 39
Grand Rapids Blow Pipe & Dust Arrester Co, Grand Rapids, Mich.
Meyer Furnace Co, Peoria, Ill.
Palmers Mfg Corp, Phoenix, Ariz.
Peabody Engrg Corp, 580 Fifth Ave, New York, N. Y.
Adv page 153
Ross, J O, Engrg Corp, New York, N. Y.
Vapor Car Heating Co, 80 E Jackson Blvd, Chicago, Ill.

HEATERS, DEAERATING

Bros, Wm, Boiler & Mfg Co, Nicollet Id, Minneapolis, Minn.
Cochrane Corp, 3106 N 17th St, Philadelphia, Pa.
Adv pages 154, 233, 240, 261, 269
Condenser Service & Engrg Co, 310 12th St, Hoboken, N. J.
Adv page 181
Croll-Reynolds Engrg Co, 17 John St, New York, N. Y.
Adv pages 222, 239
Elliott Co, Jeannette, Pa.
Adv pages 4, 5, 187
Foster Wheeler Corp, 165 Broadway, New York, N. Y.
Adv pages 38, 39
Griscom-Russell Co, 285 Madison Ave, New York, N. Y.
Hoppes Mfg Co, Belmont Ave, Springfield, Ohio
Lummus Co, 420 Lexington Ave, New York, N. Y.
Adv page 192
Permutit Co, Dept A, 330 West 42nd Street, New York, New York.
Adv pages 152, 159
Power Plant Specialty Co, 431 S Dearborn, Chicago, Ill.
Stearns-Roger Mfg Co, Denver, Colo.
Stickle Steam Specialties Co, 2217 Valley Ave, Indianapolis, Ind.
Swartwout Co, 18511 Euclid Ave, Cleveland, Ohio
Adv page 312
Worthington Pump & Machinery Corp, Harrison, N. J.
Adv page 171

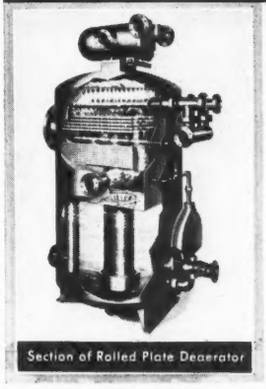
HEATERS, ENGINE-EXHAUST-GAS

American Locomotive Co, 30 Church St, New York, N. Y.
Adv pages 56, 155
Davis Engineering Corp, 1064-16 E Grand St, Elizabeth, N. J.
Foster Wheeler Corp, 165 Broadway, New York, N. Y.
Adv pages 38, 39

HEATERS, FEEDWATER

Alberger Heater Co, 287 Chicago St, Buffalo, N. Y.
Alco Products Div, 36 Church St, New York, N. Y.
Adv pages 56, 155
Bass Foundry & Mach Co, Fort Wayne, Ind.
Braun, C F, & Co, 1000 S Fremont Ave, Alhambra, Calif.
Brownell Co, 301 N Findlay St, Dayton, Ohio
Cochrane Corp, 3106 N 17th St, Philadelphia, Pa.
Adv pages 154, 233, 240, 261, 269
Condenser Service & Engrg Co, 310 12th St, Hoboken, N. J.
Adv page 181
Croll-Reynolds Engrg Co, 17 John St, New York, N. Y.
Adv pages 222, 239
Davis Engrg Corp, 1064-16 E Grand St, Elizabeth, N. J.
Elliott Co, Jeannette, Pa.
Adv pages 4, 5, 187
Foster Wheeler Corp, 165 Broadway, New York, N. Y.
Adv pages 38, 39
Graver Tank & Mfg Co, Inc, East Chicago, Ind.
Griscom-Russell Co, 285 Madison Ave, New York, N. Y.
Harrisburg Steel Corp, Harrisburg, Pa.
Hoppes Mfg Co, Belmont Ave, Springfield, Ohio

Cochrane


Section of Rolled Plate Deaerator

FOR COMPLETE REMOVAL OF DISSOLVED OXYGEN AND OTHER GASES FROM FEEDWATER

Cochrane Deaerators and Deaerating Heaters prevent corrosion in piping, economizers, etc., by removing dissolved oxygen and gases. Utilizes principle of parallel downward flow of steam and water. Four different types available:

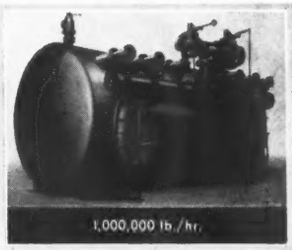
1. **TRAY-TYPE Deaerators**
2. **ATOMIZING Deaerators**
3. **HOT WATER Generators and Deaerators**
4. **COLD WATER Deaerators**

Write for Publication 3005

COCHRANE CORPORATION
3106 N. 17th Street, Philadelphia, Pa.

10,000 lb./hr.

350,000 lb./hr.


1,000,000 lb./hr.

A WIDE RANGE OF TYPES AND SIZES FOR EVERY REQUIREMENT

FEEDWATER DEAERATION

International Engrg Works Inc, Framingham, Mass.
Johnson Corp, 865 Wood St, Three Rivers, Mich.
Kroeschell Boiler Co, Racine, Wis.
Lummus Co, 420 Lexington Ave, New York, N. Y.
Adv page 192
Marshall Heater Co, Dayton, O.
Milwaukee Reliance Boiler Works, Milwaukee, Wis.
Natural Gas Equipt Corp, Inc, Los Angeles, Calif.
Patterson-Kelley Co, E Stroudsburg, Pa.
Permutit Co, Dept A, 330 W 42nd St, New York, N. Y.
Adv pages 152, 159
Power Plant Specialty Co, 431 S Dearborn, Chicago, Ill.
Richmond Engrg Co, 7th & Hospital Sts, Richmond, Va.
Ross Heater & Mfg Co, Inc, 1409 West Ave, Buffalo, N. Y.
Schutte & Koerting Co, 12th & Thompson Sts, Phila, Pa.
Stearns-Roger Mfg Co, Denver, Colo.
Stickle Steam Specialties Co, 2217 Valley Ave, Indianapolis, Ind.
Struthers-Wells Corp, Warren, Pa.
Swartwout Co, 18511 Euclid Ave, Cleveland, Ohio
Adv page 312
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61
Wheeler, C H, Mfg Co, Lehigh & Sedgley Aves, Phila, Pa.
Whitlock Mfg Co, 77 South St, Hartford, Conn.
Adv page 232
Willamette Iron & Steel Corp, Portland, Ore.
Worthington Pump & Machinery Corp, Harrison, N. J.
Adv page 171
Zallea Bros & Johnson 820 Locust St, Wilmington, Del.

HEATERS, OIL

Aeroil Burner Co, 5701 Park Ave, W New York, N. J.
Alberger Heater Co, 287 Chicago St, Buffalo, N. Y.
Alco Products Div, 36 Church St, New York, N. Y.
Adv pages 56, 155
American District Steam Co, 70 Bryant St, N Tonawanda, N. Y.
Adv page 160
Andale Co, 1600 Arch St, Philadelphia, Pa.
Babcock & Wilcox Co, 85 Liberty St, New York, N. Y.
Adv pages 8, 9, 10, 11
Black, Sivalls & Bryson, Inc, Oklahoma City, Okla.
Braun, C F, & Co, 1000 S Fremont Ave, Alhamora, Calif.
California Steel Prod Co, Barrett & A Sts, Richmond, Calif.
Coen Co, 40 Boardman Place, San Francisco, Calif.
Combustion Equipment Co, 1820 Cherry St, Kansas City, Mo.
Croll-Reynolds Engrg Co, 17 John St, New York, N. Y.
Adv pages 222, 239
Davis Engrg Corp, 1064-16 E Grand St, Elizabeth, N. J.
Foster Wheeler Corp, 165 Broadway, New York, N. Y.
Adv pages 38, 39
General Electric Co, Schenectady, N. Y.
Adv pages 32, 33
Griscom-Russell Co, 285 Madison Ave, New York, N. Y.
Hauck Mfg Co, 126 10th St, Brooklyn, N. Y.
Hynes Electric Heating Co, West & Clinton Sts, Camden, N. J.
Johnson, S T, Co, 940 Arlington, Oakland, Calif.
Leahy Mfg Co, E 8th St, Los Angeles, Calif.
Lummus Co, 420 Lexington Ave, New York, N. Y.
Adv page 192
McDermott Water Heaters, Inc, 514 Genesee St, Trenton, N. J.
Macleod Co, 2236 Bogen St, Cincinnati, Ohio
National Airoil Burner Co, 1284 E Sedgley Ave, Philadelphia, Pa.
Patterson-Kelley Co, E Stroudsburg, Pa.
Purdue, Albert G, Associates, Inc, New Haven, Conn.
Ray Oil Burner Co, 401 Bernal Ave, San Francisco, Calif.
Ross Heater & Mfg Co, Inc, 1409 West Ave, Buffalo, N. Y.
Schutte & Koerting Co, 12th & Thompson Sts, Phila., Pa.
Staples & Pfeiffer, Ltd, 528 Bryant St, San Francisco, Cal.
Struthers-Wells Corp, Warren, Pa.
Tate-Jones & Co, 23 Broad St, Leetsdale, Pa.
Trent, Harold E, Co, 55th & Wyalusing Ave, Philadelphia, Pa.
Vogt, Henry, Machine Co, 1000 W Ormsby St, Louisville, Ky.
Adv page 46
Vulcan Electric Co, 88-90 Holten St, Danvers, Mass.
Whitlock Mfg Co, 77 South St, Hartford, Conn.
Adv page 232
Zallea Bros & Johnson, 820 Locust St, Wilmington, Del.

HEATERS, STRIP AND IMMERSION, ELECTRIC

American Foundry Equipment Co, Mishawaka, Ind.
Cutler-Hammer, Inc, 315 N 12th St, Milwaukee, Wis.
Adv page 107
General Electric Co, Schenectady, N. Y.
Adv pages 32, 33
Hynes Electric Heating Co, West & Clinton Sts, Camden, N. J.
Trent, Harold E, Co, Philadelphia, Pa.
Vulcan Elec Co, 88-90 Holten St, Danvers, Mass.
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61
Wiegand, Edwin L, Co, Pittsburgh, Pa.

HEATERS, UNIT

Airtherm Mfg Co, 700 S Spring St, St Louis, Mo.
American Blower Corp, 6000 Russell St, Detroit, Mich.
American Foundry & Equip Co, Mishawaka, Ind.
Bayley Blower Co, 1817 S 66 St, Milwaukee, Wis.
Bryant Heater Co, 17825 St Clair Ave, Cleveland, Ohio
Buffalo Forge Co, 488 Broadway, Buffalo, N. Y.
Adv page 199
Burnham Boiler Corp, Irvington, N. Y.
Carrier Corp, Syracuse, N. Y.
Clarage Fan Co, 619 Porter St, Kalamazoo, Mich.
Adv page 147
Crane Co, 836 S Michigan Ave, Chicago, Ill.
Adv page 123
Dunham, C A, Co, 450 E Ohio St, Chicago, Ill.
Fedders Mfg Co, 63 Tonawanda St, Buffalo, N. Y.
Graybar Electric Co, 420 Lexington Ave, New York, N. Y.
Adv pages 214, 234, 243, 261, 265, 282, 281
Hastings Air Conditioning Co, Hastings, Neb.
Hynes Electric Heating Co, West & Clinton Sts, Camden, N. J.
Ilg Electric Ventilating Co, Chicago, Ill.
Industrial Mfg & Engrg Co, 3845 N Ravenswood Ave, Chicago, Ill.
Johnson Fan & Blower Corp, Dept P, 1319 W Lake, Chicago, Ill.
Kauffman Air Conditioning Corp, St Louis, Mo.
Kisco Co, 39th & Chouteau Ave, St Louis, Mo.
McCord Radiator & Mfg Co, Detroit, Mich.
McQuay, Inc, Minneapolis, Minn.
Marlo Coil Co, St Louis, Mo.
Modine Mfg Co, Racine, Wis.
Murray, D J, Mfg Co, Wausau, Wis.
Adv page 234
Murray Iron Works Co, Burlington, Iowa
Adv page 148
Natural Gas Equipment, Inc, 539 Petroleum Bldg, Los Angeles, Calif.
Nelson, Herman, Corp, 1840 Horton Ave, Moline, Ill.
Nesbitt, John J, Inc, State Rd & Rhawn St, Philadelphia, Pa.
Niagara Blower Co, 6 E 45th St, New York, N. Y.
Palmers Mfg Co, Phoenix, Ariz.
Rome-Turney Radiator Co, 200 Lynch St, Rome, N. Y.
Ross, J O, Engrg Corp, New York, N. Y.
Skinner Heating & Ventilating Co, 1990 N 9th, St Louis, Mo.
Sturtevant, B F, Co, 47 Readville St, Hyde Park, Boston, Mass.
Adv pages 40, 41
Surface Combustion Corp, Sieloff St, Toledo, Ohio
Trane Co, 2012 Cameron Ave, La Crosse, Wis.
U. S. Radiator Corp, Detroit, Mich.
Vulcan Electric Co, 88-90 Holten St, Danvers, Mass.
Webster, Warren, & Co, Camden, N. J.
Adv page 272
Wiegand, Edwin L, Co, Pittsburgh, Pa.
Wing, L J, Mfg Co, W 14th St, & 7th Ave, New York, N. Y.
Adv page 194
Young Radiator Co, Racine, Wis.

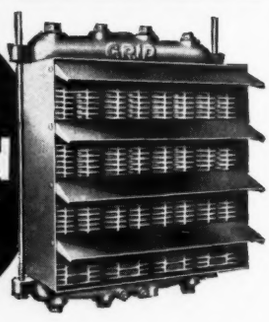
HEATERS, WATER-SUPPLY

Aeroil Burner Co, 5701 Park Ave, W New York, N. Y.
Air Devices Inc, 17 E 42nd St, New York, N. Y.
Alberger Heater Co, 287 Chicago St, Buffalo, N. Y.
American District Steam Co, 70 Bryant St, N Tonawanda, N. Y.
Adv page 160
American Locomotive Co, 30 Church St, New York, N. Y.
Adv pages 56, 155
American Radiator & Std Sanitary Corp, 40 W 40th St, New York, N. Y.
Andale Co, 1600 Arch St, Philadelphia, Pa.
Bell & Gossett Co, Chicago, Illinois
Birchfield Boiler Inc, Tacoma, Wash.
Bryant Heater Co, 17825 St Clair Ave, Cleveland, Ohio
Burnham Boiler Corp, Irvington, N. Y.
California Steel Prod Co, Barrett & A Sts, Richmond, Calif.
Cox, Abram, Mfg Corp, Lansdale, Pa.

IT'S STILL A *different* UNIT HEATER

High test cast iron takes the place of aluminum for the heating sections, to cooperate with the war effort in using substitute materials—but it's still the ultimate in unit heater quality.

NOW made with CAST IRON Heating Sections



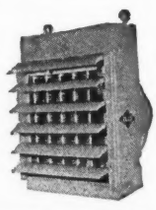
THE new Grid is engineered along the same lines as the Grid Unit which had aluminum heating sections—dependable, long life unit. A special design for performance. Patent applied for. No corrosion—no leaks or breakdowns . . . in this new Grid Unit there is only one type metal in contact with steam or hot water. There is nothing to cause electrolysis that produces corrosion. Engineered and constructed to withstand up to 250 lb. steam pressure. Ask for new catalog, engineering data and capacity tables.

D. J. MURRAY MFG. CO., Wausau, Wis.
Offices in Principal Cities

GRID UNIT HEATER

UNIT HEATERS

"GraybaR" QUALITY SINCE 1869 *REG. U.S. PAT. OFF.
Everything Electrical . . . . THAT IT TAKES TO WIN!



ONE ITEM OF THE GRAYBAR 60,000

For economical plant heating, Graybar offers the well known ILG line of unit heaters.

DISTRIBUTED BY

GraybaR ELECTRIC COMPANY

IN OVER 80 PRINCIPAL CITIES

Croll-Reynolds Engrg Co, 17 John St, New York, N. Y.
Adv pages 222, 239
Davis Engrg Corp, 1064-16 E Grand St, Elizabeth, N. J.
Eclipse Fuel Engrg Co, 707 So Main St, Rockford, Ill.
General Fittings Co, Providence, R. I.
Griscom-Russell Co, 285 Madison Ave, New York, N. Y.
Hotstream Heater Co, Cleveland, Ohio
Johanson Water Heater Co, 817 W Webster Ave, Chicago, Ill.
Johnson Corp, 865 Wood St, Three Rivers, Mich.
Johnson, S T, Co, 940 Arlington, Oakland, Calif.
Kewanee Boiler Corp, Kewanee, Ill.
Littleford Bros, 457 E Pearl St, Cincinnati, Ohio
Lookout Boiler Mfg Co, Chattanooga, Tenn.
McDermott Water Heaters, Inc, 514 Genesee St, Trenton, N. J.
Marion Machine Foundry & Supply Co, Marion, Ind.
Marshall Heater Co, Dayton, O.
Pacific Steel Boiler Div, 1056 Natl Bank Bldg, Detroit, Mich.
Patterson-Kelly Co, E Stroudsburg, Pa.
Pierce Butler Radiator Corp, 701 Nichols Ave, Syracuse, N. Y.
Quaker City Iron Works, Philadelphia, Pa.
Ray Oil Burner Co, 401 Bernal Ave, San Francisco, Calif.
Richmond Engrg Co, 7th & Hospital Sts, Richmond, Va.
Ross Heater & Mfg Co, 1409 West Ave, Buffalo, N. Y.
Stover Steel Tank & Mfg Co, Freeport, Ill.
Taco Heaters, Inc, 342 Madison Ave, New York, N. Y.
Trane Co, 2012 Cameron Ave, La Crosse, Wis.
Trent, Harold E, Co, 55th & Wyalusing Ave, Phila, Pa.
Triplex Htg Specialty Co, Peru, Ind.
Vulcan Electric Co, 8890 Holten St, Danvers, Mass.
Whitlock Mfg Co, 77 South St, Hartford, Conn.
Adv page 232
York Oil Burner Co, York, Pa.

HEATING RADIATORS

(See Radiators, Heating)

HEATING SYSTEMS, HOT WATER

Airtemp Div, Chrysler Corp, Dayton, Ohio
American Blower Corp, 6000 Russell St, Detroit, Mich.
American Radiator & Std Sanitary Corp, 40 W 40th St, New York, N. Y.
Burnham Boiler Corp, Irvington, N. Y.
California Steel Products Co, Barrett & A Sts, Richmond, Calif.
Commodore Heaters Corp, 11 W 42nd St, New York, N. Y.
Hoffman Specialty Co, 1001 York St, Indianapolis, Ind.
Johnson, S T, Co, 940 Arlington Ave, Oakland, Calif.
Pierce Butler Radiator Corp, 701 Nichols Ave, Syracuse, N. Y.
Ross, J O, Engrg Corp, New York, N. Y.
Trane Co, 2012 Cameron Ave, La Crosse, Wis.
Triplex Heating Specialty Co, Peru, Ind.
York Oil Burner Co, York, Pa.

HEATING SYSTEMS, STEAM, VACUUM AND VAPOR

American Blower Corp, 6000 Russell St, Detroit, Mich.
American Radiator & Std Sanitary Corp, 40 W 40th St, New York, N. Y.
Barnes & Jones Inc, 128 Brookside Ave, Jamaica Plain, Mass.
Burnham Boiler Corp, Irvington, N. Y.
Cashin, W D, Co, 69 A St, Boston, Mass.
Cox, Abram, Mfg Corp, Lansdale, Pa.
Dunham, C A, Co, 450 E Ohio St, Chicago, Ill.
Gorton Htg Corp, Cranford, N. J.
Hoffman Specialty Co, 1001 York St, Indianapolis, Ind.
Illinois Engrg Co, Racine Ave & 21st St, Chicago, Ill.
Marsh, Jas P, Corp, 2049 Southport Ave, Chicago, Ill.
Monash-Younker Co, Inc, 1315 W Congress St, Chicago, Ill.
Pierce Butler Radiator Corp, 701 Nichols Ave, Syracuse, N. Y.
Sarco Co, 475 5th Ave, New York, N. Y.
Sturtevant, B F, Co, 47 Readville St, Boston, Mass.
Adv pages 40, 41
Tallmadge, Webster, & Co, 255 N 18th St, East Orange, N. J.
Trane Co, 2012 Cameron Ave, La Crosse, Wis.
U. S. Radiator Corp, Detroit, Mich.
Webster, Warren & Co, Camden, N. J.
Adv page 272
York Oil Burner Co, York, Pa.

HEMP PACKING

(See Packing, Hemp)

HOISTS, ELECTRIC, PNEUMATIC

American Chain Co, York, Pa.
American Engrg Co, Aramingo Ave, Philadelphia, Pa.
Adv pages 12, 13
American Hoist & Derrick Co, St Paul, Minn.
Chisholm-Moore Hoist Corp, 6015 Fremont Ave, Tonawanda, N. Y.
Cleveland Crane & Engrg Co, Wickliffe, Ohio
Clyde Iron Works, Duluth, Minn.
Coffing Hoist Co, Danville, Ill.
Conco Engrg Works, Mendota, Ill.
Curtis Pneumatic Machinery Co, 1934 Kien Ave, St Louis, Mo.
Dake Engine Co, 633 Monroe St, Grand Haven, Mich.
Detroit Hoist & Machine Co, Detroit, Mich.
Dravo Corp, Pittsburgh, Pa.
Euclid Crane & Hoist Co, Euclid, Ohio
Graybar Electric Co, 420 Lexington Ave, New York, N. Y.
Adv pages 214, 234, 243, 261, 265, 282, 284
Harnischfeger Corp, Milwaukee, Wis.
Harrington Co, 17th & Callowhill Sts, Philadelphia, Pa.
Independent Pneumatic Tool Co, 600 W Jackson Blvd, Chicago, Ill.
Ingersoll-Rand Co, 11 Broadway, New York, N. Y.
Adv pages 168, 169
Lidgerwood Mfg Co, Elizabeth, N. J.
Louden Machinery Co, Fairfield, Iowa.
McCollum Hoist & Mfg Co, Downers Grove, Ill.
Northern Engrg Works, Detroit, Mich.
Novo Engine Co, 1 Porter St, Lansing, Mich.
O K Clutch & Machinery Co, Columbia, Pa.
Philadelphia Gear Works, Erie Ave & G St, Philadelphia, Pa.
Adv page 57
Robbins & Myers, Inc, Springfield, Ohio
Shaw-Box Crane & Hoist Div, Reading, Pa.
Shepard Niles Crane & Hoist Corp, 453 Schuyler Ave, Montour Falls, N. Y.
Stearns-Roger Mfg Co, Denver, Colo.
Stephens-Adamson Mfg Co, 5 Ridgeway Ave, Aurora, Ill.
Adv page 175
Sullivan Machinery Co, Michigan City, Ind.
Union Mfg Co, New Britain, Ct.
Vulcan Iron Works, 750 S Main St, Wilkes-Barre, Pa.
Wheeler, C H Mfg Co, Lehigh & Sedgley Aves, Philadelphia, Pa.
Williamette Iron & Steel Corp, Portland, Ore.
Wright Mfg Div, American Chain & Cable Co, York, Pa.
Yale & Towne Mfg Co, Stamford, Conn.

HOISTS, HAND

Aeroil Burner Co, 5701 Park Ave, W New York, N. J.
American Chain Co, York, Pa.
Beebe Bros, Inc, 2724 Sixth Ave, S, Seattle, Wash.
Bridgeport Chain & Mfg Co, Bridgeport, Conn.
Chisholm-Moore Hoist Corp, 6015 Fremont Ave, Tonawanda, N. Y.
Cleveland Crane & Engrg Co, Wickliffe, Ohio
Coffing Hoist Co, Danville, Ill.
Conco Engrg Works, Mendota, Ill.
Ford Chain Block Div, American Chain & Cable Co, York, Pa.
Gifford-Wood Co, 24 Hill St, Hudson, N. Y.
Graybar Electric Co, 420 Lexington Ave, New York, N. Y.
Adv pages 214, 234, 243, 261, 265, 282, 284
Harrington Co, 17th & Callowhill Sts, Philadelphia, Pa.
Louden Machy Co, Fairfield, Iowa
McCollom Hoist & Mfg Co, Downers Grove, Ill.
Robbins & Myers, Inc, Springfield, Ohio
Ryerson, Jos T, & Sons, Inc, 16th & Rockwell Sts, Chicago, Ill.
Shaw-Box Crane & Hoist Div, Muskegon, Mich.
Stephens-Adamson Mfg Co, 5 Ridgeway Ave, Aurora, Ill.
Adv page 175
Union Mfg Co, New Britain, Conn.
Wright Mfg Div, American Chain & Cable Co, York, Pa.
Yale & Towne Mfg Co, Stamford, Conn.

HOISTS, SKIP

Bartlett, C O, & Snow Co, Cleveland, Ohio
Beaumont-Birch Co, Philadelphia, Pa.
Brady Conveyors Corp, 20 W Jackson Blvd, Chicago, Ill.
Continental Gin Co, 4600 Fourth Ave, South, Birmingham, Ala.
Euclid Crane & Hoist Co, Euclid, Ohio
Fairfield Engrg Co, 305 Barnhart St, Marion, Ohio
Gifford-Wood Co, 24 Hill St, Hudson, N. Y.
Godfrey Conveyor Co, Dept A-77, Elkhart, Ind.
Jeffrey Mfg Co, 932-99 N 4th St, Columbus, Ohio
Lidgerwood Mfg Co, Elizabeth, N. J.
Link-Belt Co, 300 W Pershing Rd, Chicago, Ill.
Adv page 3
McNally Pittsburg Mfg Co, Pittsburg, Kansas
Novo Engine Co, 1 Porter St, Lansing, Mich.
Palmer-Bee Co, Detroit, Mich.
Robins Conveying Belt Co, Passaic, N. J.
Adv page 188
Stearns-Roger Mfg Co, Denver, Colo.
Stephens-Adamson Mfg Co, 5 Ridgeway Ave, Aurora, Ill.
Adv page 175
Webster Mfg Inc, Tiffin, Ohio

HOPPERS, COAL AND ASH

Alpha Tank & Sheet Metal Mfg Co, 5005 S 38th St, St Louis, Mo.
American Engrg Co, Aramingo Ave, Philadelphia, Pa.
Adv pages 12, 13
Bartlett, C O, & Snow Co, Cleveland, Ohio
Beaumont-Birch Co, 1505 Race St, Philadelphia, Pa.
Bergen Point Iron Works, Bayonne, N. J.
Bethlehem Steel Co, Bethlehem, Pa.
Bos-Hatten, Inc, Buffalo, N. Y.
Brady Conveyors Corp, 20 W Jackson Blvd, Chicago, Ill.
Chain Belt Co, 1674 W Bruce St, Milwaukee, Wis.
Chattanooga Boiler & Tank Co, Box 110, Chattanooga, Tenn.
Chicago Bridge & Iron Co, 2454 McCormick Bldg, Chicago, Ill.
Colonial Iron Works, 17643 St Clair Ave, Cleveland, Ohio
Connery Construction Co, 2nd & Luzerne Sts, Phila, Pa.
Dover Boiler Works, 90 E Dickerson St, Dover, N. J.
Dravo Corp, Pittsburgh, Pa.
Fairfield Engrg Co, 305 Barnhart St, Marion, Ohio
Gifford-Wood Co, 24 Hill St, Hudson, N. Y.
Hahn Engrg Div, 233 Broadway, New York, N. Y.
Jeffrey Mfg Co, 932-99 N 4th St, Columbus, Ohio
Leader Iron Works, Inc, Decatur, Ill.
Link-Belt Co, 300 W Pershing Rd, Chicago, Ill.
Adv page 3
Littleford Bros, 457 E Pearl St, Cincinnati, Ohio
McNally Pittsburg Mfg Co, Pittsburg, Kansas
Richmond Engrg Co, 7th & Hospital Sts, Richmond, Va.
Robins Conveying Belt Co, Passaic, N. J.
Adv page 188
Stearns-Roger Mfg Co, Denver, Colo.
Stephens-Adamson Mfg Co, 5 Ridgeway Ave, Aurora, Ill.
Adv page 175
Stock Engrg Co, 9805 Theodore Ave, Cleveland, Ohio
Adv page 164
Stover Steel Tank & Mfg Co, Freeport, Ill.
Treadwell, M H, Co, 140 Cedar St, New York, N. Y.
Union Boiler & Mfg Co, 52 Vanderbilt Ave, New York, N. Y.
United Conveyor Corp, 37 W Van Buren St, Chicago, Ill.

HOSE, AIR

American Metal Hose Branch of American Brass Co, Waterbury, Conn.
Adv page 121
Anchor Packing Co, 401 N Broad St, Philadelphia, Pa.
Atlantic Metal Hose Co, 107 W 64th St, New York, N. Y.
Boston Woven Hose & Rubber Co, Cambridge, Mass.
Chicago Metal Hose Corp, 1312 S 3rd Ave, Maywood, Ill.
Chicago Pneumatic Tool Co, 6-8 E 44th St, New York, N. Y.
Cincinnati Rubber Mfg Co, 4901 Franklin Ave, Cincinnati, O.
Continental Rubber Works, Erie, Pa.
Eclipse Aviation Corp, Wissahickon Ave, Philadelphia, Pa.
Elliott Co, Springfield, Ohio.
Adv pages 4, 5, 187
Gates Rubber Co, 999 S Broadway, Denver, Colo.
Goodrich, B F, Co, 460 S Main St, Akron, Ohio.
Goodyear Tire & Rubber Co, 1144 E Market St, Akron, O.
Hewitt Rubber Co, Buffalo, N. Y.
Independent Pneumatic Tool Co, 600 W Jackson, Chicago, Ill.
Ingersoll-Rand Co, 11 Broadway, New York, N. Y.
Adv pages 168, 169
Manhattan Rubber Mfg Div, 94 Townsend St, Passaic, N. J.
Mulconroy Co, 54th & Jefferson Sts, Philadelphia, Pa.
N. Y. Belting & Packing Co, Passaic, N. J.
Pennsylvania Flexible Metallic Tubing Co, 7202 Powers Lane, Philadelphia, Pa.
Pioneer Rubber Mills, 345 Sacramento St, San Francisco, Cal.
Quaker Rubber Corp, Comly & Milnor Sts, Philadelphia, Pa.
Republic Rubber Div, Lee Tire & Rubber Corp, Youngstown, Ohio
Sullivan Machinery Co, Michigan City, Ind.
Thermoid Rubber Div, Whitehead Rd, Trenton, N. J.
Titeflex Metal Hose Co, Frelinghuysen Ave, Newark, N. J.
U. S. Rubber Co, 1230 6th Ave, New York, N. Y.
Westinghouse Air Brake Co, Wilmerding, Pa.

HOSE, FLEXIBLE METAL

(See Tubing, Flexible, Metal)

HOSE, FIRE

Continental Rubber Works, Erie, Pa.
Fabric Fire Hose Co, Sandy Hook, Conn.
Goodrich, B F, Co, 460 S Main St, Akron, Ohio
Goodyear Tire & Rubber Co, 1144 E Market St, Akron, O.
Hamilton Rubber Mfg Co, Trenton, N. J.
Hewitt Rubber Co, Buffalo, N. Y.
Manhattan Rubber Mfg Div, 94 Townsend St, Passaic, N. J.
New York Belting & Packing Co, Passaic, N. J.
Pioneer Rubber Mills, 345 Sacramento St, San Francisco, Cal.

ARMSTRONG STEAM TYPE HUMIDIFIERS

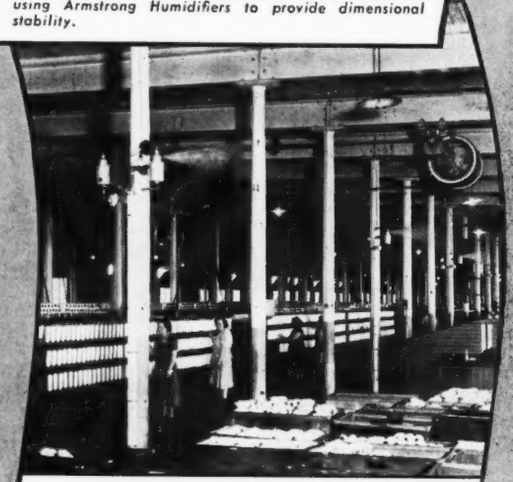
1. **PREVENT loss of weight, strength or quality of hygroscopic materials.**
2. **IMPROVE workability of materials.**
3. **CONTROL troublesome or dangerous dust and static conditions.**
4. **PROVIDE healthier working conditions.**
5. **CONTROL drying processes.**

WARPING, shrinking and checking of wood . . . curling of paper . . . brittleness and breaking of textile fibers . . . improper drying . . . static electricity on moving machinery . . . cracking of leather—these are just a few of the evils of dry air that are being successfully overcome by Armstrong Steam Type Humidifiers, in many different industries.

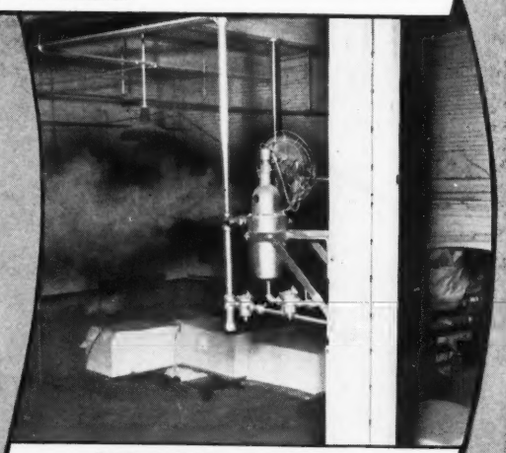
Armstrong Humidifiers are the practical, efficient answer to humidification problems. Installed like unit heaters, they are connected into existing steam lines and electrical circuit. Low in cost, units capable of handling up to 40,000 cu. ft. of space or more list at only $100.00 complete with sensitive Friez humidistat. They are positive, automatic and silent. Operation on low cost steam is inexpensive. No dripping, no puddles. Write for full details.

ARMSTRONG MACHINE WORKS
812 Maple St. • Three Rivers, Mich.

FOR PRECISION WOODWORKING
An increasing number of plants handling wood are using Armstrong Humidifiers to provide dimensional stability.



FOR TEXTILE PLANTS
Textile plants all over the country have reduced fiber breakage and stepped up production with Armstrong humidification.



FOR PAPER STORAGE
Cartons, printing paper, labels, etc., are kept in good condition by humidification as hundreds of users of Armstrong Humidifiers will testify.

— AND FOR MANY OTHER INDUSTRIES

SEND FOR THIS BULLETIN!
NEW Armstrong Humidifier Bulletin tells how many plants in a wide range of industries have solved their dry air problems with Armstrong Steam Type Humidifiers.

BUILT BY THE MAKERS OF ARMSTRONG STEAM TRAPS

Quaker Rubber Corp, Comly & Milnor Sts, Philadelphia, Pa.
Republic Rubber Div, Lee Tire & Rubber Corp, Youngstown, Ohio
Thermoid Rubber Div, Whitehead Rd, Trenton, N. J.
U. S. Rubber Co, 1230 6th Ave, New York, N. Y.

HOSE, GASOLINE, OIL

American Metal Hose Branch of American Brass Co, Waterbury, Conn.
Adv page 121
Atlantic Metal Hose Co, Inc, 107 W 64th, New York, N. Y.
Chiksan Tool Co, Brea, Cal.
Continental Rubber Works, Erie, Pa.
Eclipse Aviation Corp, Wissahickon Ave, Philadelphia, Pa.
Gates Rubber Co, 999 S Broadway, Denver, Colo.
Goodrich, B F, Co, 460 S Main St, Akron, Ohio
Goodyear Tire & Rubber Co, 1144 E Market St, Akron, O.
Hewitt Rubber Co, Buffalo, N. Y.
Manhattan Rubber Mfg Div, 94 Townsend St, Passaic, N. J.
Mulconroy Co, 54th & Jefferson Sts, Philadelphia, Pa.
New York Belting & Packing Co, Passaic, N. J.
Norgren, C A, Co, 210 Santa Fe Drive, Denver, Colo.
Pennsylvania Flexible Metallic Tubing Co, 7202 Powers Lane, Philadelphia, Pa
Pioneer Rubber Mills, 345 Sacramento St, San Francisco, Cal.
Quaker Rubber Corp, Comly & Milnor Sts, Phila, Pa.
Republic Rubber Div, Lee Tire & Rubber Corp, Youngstown, Ohio.
Seamlex Co, 27-27 Jackson Ave, Long Island City, N. Y.
Thermoid Rubber Div, Whitehead Rd, Trenton, N. J.
Titeflex Metal Hose Co, Frelinghuysen Ave, Newark, N. J.
U. S. Rubber Co, 1230 6th Ave, New York, N. Y.

HOSE, STEAM

American Metal Hose Branch of American Brass Co, Waterbury, Conn.
Adv page 115
Atlantic Metal Hose Co, Inc, 107 W 64th St, New York, N. Y.
Chicago Metal Hose Corp, 1312 S Third Ave, Maywood, Ill.
Chiksan Tool Co, Brea, Cal.
Cincinnati Rubber Mfg Co, 4901 Franklin, Cincinnati, O.
Continental Rubber Works, Erie, Pa.
Eclipse Aviation Corp, Wissahickon Ave, Philadelphia, Pa.
Elliott Co, Springfield, Ohio.
Adv pages 4, 5, 187
Gates Rubber Co, 999 S Broadway, Denver, Colo.
Goodrich, B F, Co, 460 S Main St, Akron, Ohio
Goodyear Tire & Rubber Co, 1144 E Market St, Akron, O.
Hewitt Rubber Co, Buffalo, N. Y.
Manhattan Rubber Mfg Div, 94 Townsend St, Passaic, N. J.
Mulconroy Co, 54th & Jefferson Sts, Philadelphia, Pa.
New York Belting & Packing Co, Passaic, N. J.
Pennsylvania Flexible Metallic Tubing Co, 7202 Powers Lane, Philadelphia, Pa.
Pioneer Rubber Mills, 345 Sacramento St, San Francisco, Cal
Quaker Rubber Corp, Comly & Milnor Sts, Philadelphia, Pa.
Republic Rubber Div, Lee Tire & Rubber Corp, Youngstown, Ohio
Seamlex Co, 27-27 Jackson Ave, Long Island City, N. Y.
Thermoid Rubber Div, Whitehead Rd, Trenton, N. J.
Titeflex Metal Hose Co, Frelinghuysen Ave, Newark, N. J.
U. S. Rubber Co, 1230 6th Ave, New York, N. Y.

HOSE ACCESSORIES

Akron Brass Mfg Co, Wooster, O.
Band-It Co, 25-36 Walnut St, Denver, Colo.
Boston Coupling Co, Boston, Mass.
Boston Woven Hose & Rubber Co, Cambridge, Mass.
Cleveland Pneumatic Tool Co, Cleveland, Ohio
Continental Rubber Works, Erie, Pa.
Dallett Co, 165 W Clearfield St, Philadelphia, Pa.
Dayton Pneumatic Tool Co, 7 Norwood Ave, Dayton, Ohio
De Vilbiss Co, Toledo, Ohio
Dixon Valve & Coupling Co, Philadelphia, Pa.
Independent Pneumatic Tool Co, 600 W Jackson Blvd, Chicago, Ill.
Ingersoll-Rand Co, 11 Broadway, New York, N. Y.
Adv pages 168, 169
King Pneumatic Tool Co, N Ashland Ave, Chicago, Ill.
Mulconroy Co, 54th & Jefferson Sts, Philadelphia, Pa.
New York Belting & Packing Co, Passaic, N. J.
Norgren, C A, Co, 210 Santa Fe Drive, Denver, Colo.
Ross Sprinkler Co, 34 Roberts St, Pasadena, Calif.
Sherman, H B, Mfg Co, Battle Creek, Mich.
Thermoid Rubber Div, Whitehead Rd, Trenton, N. J.
Westinghouse Air Brake Co, Wilmerding, Pa.

HUMIDIFIERS, CENTRAL PLANT

Air & Refrigeration Corp, 475 Fifth Ave, New York, N. Y.
American Blower Corp, 6000 Russell St, Detroit, Mich.
Armstrong Machine Works, 812 Maple St, Three Rivers, Mich.
Adv pages 236, 270
Bahnson Co, Winston-Salem, N. C.
Barber Colman Co, Rockford, Ill.
Carrier Corp, Syracuse, N. Y.
Clarage Fan Co, 619 Porter St, Kalamazoo, Mich.
Adv page 147
Johnson Service Co, 507 E Michigan St, Milwaukee, Wis.
Niagara Blower Co, 6 E 45th St, New York, N. Y.
Parks-Cramer Co, Fitchburg, Mass.
Powers Regulator Co, 2771-2 Greenview Ave, Chicago, Ill.
Ross, J O, Engrg Corp, New York, N. Y.
Standard Engrg Works, Pawtucket, R. I.
Sturtevant, B F, Co, 47 Readville St, Hyde Park, Boston, Mass.
Adv pages 40, 41
Surface Combustion Div, Sieloff St, Toledo, Ohio
Trane Co, 2012 Cameron Ave, La Crosse, Wis.

HUMIDIFIERS, DIRECT, SPRAY HEAD

American Blower Corp, 6000 Russell St, Detroit, Mich.
Bahnson Co, Winston-Salem, N. C.
Buffalo Forge Co, 488 Broadway, Buffalo, N. Y.
Adv page 199
Carrier Corp, Syracuse, N. Y.
Chelsea Fan & Blower Co, 1260 Grove St, Newark, N. J.
Clarage Fan Co, 619 Porter St, Kalamazoo, Mich.
Adv page 147
McDonnell & Miller, Rm 1305, Wrigley Bldg, Chicago, Ill.
Marley Co, Fairfax Road & Marley Ave, Kansas City, Kan.
Adv page 268
Parks-Cramer Co, Fitchburg, Mass.
Pfening, Fred D, Co, 1075 W 5th Ave, Columbus, Ohio
Ross Sprinkler Co, 34 Roberts St, Pasadena, Calif.
Spraying Systems Co, 40210 W Lake St, Chicago, Ill.
Supreme Electric Products Corp, 123 Ames, Rochester, N. Y.
Surface Combustion Div, Sieloff St, Toledo, Ohio
Trane Co, 2012 Cameron Ave, La Crosse, Wis.

HUMIDIFIERS, UNIT ROOM

Air & Refrigeration Corp, 475 Fifth Ave, New York, N. Y.
Armstrong Machine Works, 812 Maple St, Three Rivers, Mich.
Adv pages 236, 270
Bahnson Co, Winston-Salem, **N. C.**
Carrier Corp, Syracuse, N. Y.
Grinnell Co, Inc, 277 W Exchange St, Providence, R. I.
Adv page 156
Hotstream Heater Co, Cleveland, Ohio
Niagara Blower Co, 6 E 45th St, New York, N. Y.
Parks-Cramer Co, Fitchburg, **Mass.**
Pfening, Fred D, Co, 1075 W 5th Ave, Columbus, Ohio
Standard Engrg Works, Pawtucket, R. I.

HUMIDISTATS

Bahnson Co, Winston-Salem, N. C.
Barber Colman Co, Rockford, Ill.
Friez, Julien P, Div, 4 N Central Ave, Baltimore, Md.
Johnson Service Co, 507 E Michigan St, Milwaukee, Wis.
Penn Electric Switch Co, Goshen, Ind.
Powers Regulator Co, 2771-2 Greenview Ave, Chicago, Ill.
Standard Engrg Works, Pawtucket, R. I.

HYDRAULIC PACKING

(See Packing, Hydraulic)

ICE TANKS

(See Tanks, Ice)

INDICATORS, ENGINE

American Instrument Co, Silver Spring, Md.
Bacharach Industrial Instrument Co, 7000 Bennett, Pittsburgh, Pa.
Adv page 289
Crosby Steam Gage & Valve Co, 40 Church St, New York, N. Y.
R C A Mfg Co, Camden, N. J.
Trill Indicator Co, 38 E South St, Corry, Pa.

INDICATORS, POSITION, VALVE, DAMPER

Bailey Meter Co, 1036 Ivanhoe Rd, Cleveland, Ohio
Adv pages 14, 15
Bristol Co, Waterbury, Conn.
Crane Co, 836 S Michigan Ave, Chicago, Ill.
Adv page 123
Electric Tachometer Corp, Spring Garden St, Phila, Pa.
General Electric Co, Schenectady, N. Y.
Adv pages 32, 33
Northern Equipment Co, 1221 Grove Drive, Erie, Pa.
Adv page 119
Tejax Engrg Corp, 1 Allens Ave, Providence, R. I.
Adv page 237

INDICATORS, POWER-FACTOR

General Electric Co, Schenectady, N. Y.
Adv pages 32, 33
Roller-Smith Co, 1766 W Market St, Bethlehem, Pa.
Adv page 206
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61
Weston Electrical Instrument Corp, 614 Frelinghuysen Ave, Newark, N. J.
Adv pages 202, 267

INDICATORS, REMOTE LOAD

Autocall Co, Shelby, Ohio.
Bendix Aviation Corp, Marine Div, 754 Lexington Ave, Brooklyn, N. Y.
Bristol Co, Waterbury, Conn.
General Electric Co, Schenectady, N. Y.
Adv pages 32, 33
Leeds & Northrup Co, 4970 Stenton Ave, Philadelphia, Pa.
Adv page 2nd cover

INDICATORS, SIGHT-FEED

Bowser, S F, & Co, 1302 E Creighton Ave, Fort Wayne, Ind.
Cochrane Corp, 3106 N 17th St, Phila, Pa.
Adv pages 154, 233, 240, 261, 269
Fischer & Porter Co, 60 County Line Rd, Hatboro, Pa.
Foster Engineering Co, 109 Monroe St, Newark, N. J.
Adv pages 230, 257, 259, 276
Henszey Co, 202½ N Water St, Watertown, Wis.
Nugent, Wm, Co, 402 N Hermitage Ave, Chicago, Ill.

INDICATORS, SOUND LEVEL

General Electric Co, Schenectady, N. Y.
Adv pages 32, 33
Schaub, Fred H, Engrg Co, 325 W Huron St, Chicago, Ill.

INDICATORS, SMOKE

(See Smoke Indicators)

INDICATORS, VISCOSITY

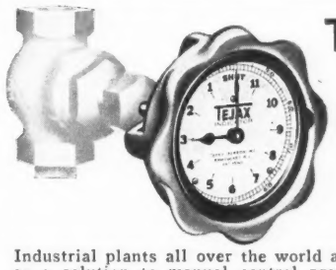
Fischer & Porter Co, 60 County Line Rd, Hatboro, Pa.
Visco-Meter Corp, 315 Grote St, Buffalo, N. Y.

INJECTORS

American Injector Co, Detroit, Mich.
American Pumps, Inc, Cincinnati, Ohio
Fischer & Porter Co, 60 County Line Rd, Hatboro, Pa.
Hancock Valve Div, Manning, Maxwell & Moore, 143 Elias St, Bridgeport, Conn.
McAlear Mfg Co, Chicago, Ill.
Nathan Mfg Co, 250 Park Ave, New York, N. Y.
Ohio Injector Co, 150 Ohio Ave, Wadsworth, Ohio
Schutte & Koerting Co, 12th & Thompson Sts, Phila, Pa.
Sellers, William, & Co, 1600 Hamilton St, Philadelphia, Pa.

INSTRUMENTS, ELECTRIC-MEASURING

Alemite Div, 1826 Diversey Pkwy, Chicago, Ill.
Autocall Co, Shelby, Ohio
Biddle, James G, Co, 1211-13 Arch St, Philadelphia, Pa.
Adv page 138
Bristol Co, Waterbury, Conn.



TEJAX VALVE POSITION INDICATORS

Handwheels for Dial Indicating Hand Regulating Valves

Industrial plants all over the world are using Tejax Indicators as a solution to manual control problems . . . process work, breweries, refineries, power services, chemical plants, building . . . in hundreds of different applications, where you want the same result each time.

Send for Bulletin

TEJAX ENGINEERING CORP.

2 Allens Ave. Providence, R. I.

Brown Instrument Co, 4490 Wayne Ave, Philadelphia, Pa.
Adv pages 51, 240, 254, 258, 266
Burlington Instrument Corp, 316 Valley St, Burlington, Iowa
Esterline-Angus Co, Box 596, Indianapolis, Ind.
General Electric Co, Schenectady, N. Y.
Adv pages 32, 33
Graybar Electric Co, 420 Lexington Ave, New York, N. Y.
Adv pages 214, 234, 243, 261, 265, 282, 284
Leeds & Northrup Co, 4970 Stenton Ave, Philadelphia, Pa.
Adv page 2nd cover
Roller-Smith Co, 1766 W Market St, Bethlehem, Pa.
Adv page 206
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61
Weston Electrical Instrument Corp, Newark, N. J.
Adv pages 202, 267
Wheelco Instruments Co, 863 W Harrison St, Chicago, Ill.
Adv pages 203, 216, 254, 258

INSULATION, HEAT, BUILDING

Armstrong Cork Co, Lancaster, Pa.
Adv page 218
Baldwin-Hill Co, 575 Klagg Ave, Trenton, N. J.
Adv pages 204, 209, 238
Bird-Archer Co, 400 Madison Ave, New York, N. Y.
Adv pages 225, 238, 282, 283
Botfield Refractories Co, 776-82 S Swanson St, Phila, Pa.
Adv page 255
Celotex Corp, 120 South La Salle St, Chicago, Ill.
Eagle-Picher Sales Co, 901 Temple Bar Bldg, Cincinnati, Ohio
Johns-Manville, 22 E 40th St, New York, N. Y.
Adv pages 44, 45
Owens-Corning Fiberglas Corp, Toledo, Ohio
Ric-wiL Co, 1562 Union Commerce Bldg, Cleveland, Ohio
Adv page 193
Universal Zonolite Insulation Co, 135 South La Salle, Chicago.

INSULATION, HEAT, PIPE-COVERING, BLANKETS, BLOCKS

Armstrong Cork Co, Lancaster, Pa.
Adv page 218
Baldwin-Hill Co, 575 Klagg Ave, Trenton, N. J.
Adv pages 204, 209, 238
Barrett Co, 40 Rector St, New York, N. Y.
Carey, Philip, Mfg Co, Lockland, Ohio
Adv page back cover
Eagle-Picher Sales Co, 901 Temple Bar Bldg, Cincinnati, Ohio
Ehret Magnesia Mfg Co, Inc, Valley Forge, Pa.
Adv page 157
General Insulating & Mfg Co, Alexandria, Ind.
Johns-Manville, 22 E 40th St, New York, N. Y.
Adv pages 44, 45
Keasbey & Mattison Co, Butler Pike, Ambler, Pa.
Adv page 137
Mexico Refract Co, Mexico, Mo.
Nightingale & Childs, Inc, Cambridge, Mass.
Owens-Corning Fibreglas Corp, Toledo, Ohio
Plibrico Jointless Firebrick Co, 1818 Kingsbury St, Chicago, Ill.
Adv pages 205, 206, 255, 282
Porter, H W, & Co, 825 Frellinghuysen Ave, Newark, N. J.
Adv page 214
Quigley Co, 56 W 45th St, New York, N. Y.
Refractory & Insulation Corp, 381 4th Ave, New York, N. Y.
Ric-wiL Co, 1563 Commerce Bldg, Cleveland, Ohio
Adv page 193
Standard Asbestos Mfg Co, 820 W Lake St, Chicago, Ill.
Union Asbestos & Rubber Co, 1821 S 54th Ave, Cicero, Ill.
Adv pages 204, 238, 248, 273
Universal Zonolite Insulation Co, 135 South La Salle St, Chicago, Ill.

BACITE INSULATIONS

High insulating value, low shrinkage, minimum of cracking, Bacite insulations are made from mineral wool. Easily installed, durable and effective.

BACITE INSULATING CEMENT
BACITE COLD SET CEMENT
BACITE ANTI-SWEAT CEMENT

Write for Details

THE BIRD-ARCHER CO.

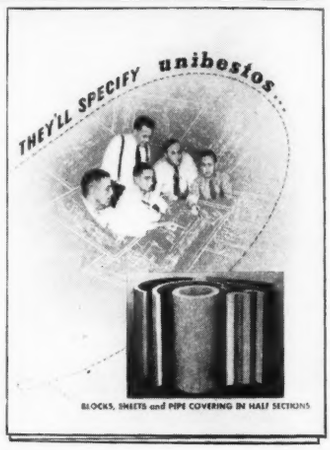
Scientific Water Conditioning
SINCE 1885

New York, N. Y. 100 Madison Ave.
Chicago, Ill. Wrigley Building
Philadelphia, Pa. 1337 No. American St.

The Bird-Archer Co. Ltd. McGill Building, Montreal, Canada

HEAT INSULATION DATA *for Engineers*

WE will be glad to send you a copy of this handy 8 page bulletin containing all data needed for figuring most insulation jobs. It shows heat losses, surface temperatures, recommended thicknesses, etc. Illustrated with numerous pictures showing how insulation application can be simplified and speeded up with UNI-BESTOS — the modern "high efficiency" heat insulation. Write for your copy.



UNARCO
UNION ASBESTOS & RUBBER CO.
1811 S. 54th Ave., Cicero, Illinois
CHICAGO—310 S. Michigan Ave. NEW YORK—420 Lexington Ave.
SAN FRANCISCO—116 New Montgomery St.
Contractor-Distributors Located in Principal Industrial Centers

B-H

HEAT INSULATION PRODUCTS

Developed by Insulation Engineers, BALDWIN-HILL products have proved highly effective for providing high operating efficiencies by eliminating preventable waste of heat and power. There's a type to meet every condition of service.

B-H ROCKWOOL BLANKET
Made from high temperature and moisture resisting Black Rockwool, felted between various types of metal fabrics. Effective up to 1200° F.

B-H No. 1 Insulating CEMENT
For odd shapes as well as flat surfaces. Easy to mix and apply. Effective up to 1800° F. Reclaimable up to 1200° F. High coverage, low volume shrinkage. Rust inhibitor prevents corrosion.

B-H MONO-BLOCK
Preformed block felted of B-H Black Rockwool and bonded together to form lightweight, heat and moisture resistant insulation. Effective up to 1600° F.

B-H WEATHERSEAL
A durable weatherproof coating to protect insulated surfaces against disintegration and loss of efficiency through infiltration of air, moisture.

Send for CATALOG
showing complete line including Pipe Covering, Low Temperature Insulating Board, Insulating Wool, Duct Lining, Diatomaceous Earth and Asbestos Products.

BALDWIN-HILL CO. 575 KLAGG AVE. TRENTON, N. J.
Branch Offices: NEW YORK KALAMAZOO, MICH.

INSULATION, SOUND-DEADENING

Baldwin-Hill Co, 575 Klagg Ave, Trenton, N. J.
Adv pages 204, 209, 238
Celotex Corp, 120 South La Salle St, Chicago, Ill.
Johns-Manville, 22 E 40th St, New York, N. Y.
Adv pages 44, 45
Korfund Co, 48-23 32nd Pl, Long Island City, N. Y.

INSULATORS, ELECTRIC

Colt's Patent Fire Arms Mfg Co, Hartford, Conn.
Continental-Diamond Fibre Co, Dept 18, Newark, Del.
Corning Glass Works, Dept IP, Corning, N. Y.
Delta-Star Electric Co, Fulton St, Chicago, Ill.
Gatke Corp, 228 North La Salle St, Chicago, Ill.
General Electric Co, Schenectady, N. Y.
Adv pages 32, 33
Graybar Electric Co, 420 Lexington Ave, New York, N. Y.
Adv pages 214, 234, 243, 261, 265, 282, 284
Locke Insulator Corp, Baltimore, Md.
Ohio Brass Co, Mansfield, Ohio
Schweitzer & Conrad, Inc, 4435 N Ravenswood Ave, Chicago, Ill.
Southern States Equipment Corp, Birmingham, Ala.
Western Rubber Co, Goshen, Ind.
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61

INSURANCE, CASUALTY

(See Casualty Insurance)

INTERLOCKS, SAFETY-SWITCH

Bendix Aviation Corp, Marine Div, 754 Lexington Ave, Brooklyn, N. Y.
Railway & Industrial Engrg Co, Greensburgh, Pa.

ISOLATION, VIBRATION

American Metal Hose Branch, American Brass Co, Waterbury, Conn.
Adv page 121
Armstrong Cork Co, Lancaster, Pa.
Adv page 218
Butterworth, B T, Jr, New Canaan, Conn.
Chicago Metal Hose Corp, 1312 S Third Ave, Maywood, Ill.
Cork Import Corp, 330 W 42nd St, New York, N. Y.
Goodrich, B F, Co, 460 S Main St, Akron, Ohio
Johns-Manville, 22 E 40th St, New York, N. Y.
Adv pages 44, 45
Keldur Corp, 420 Lexington Ave, New York, N. Y.
Korfund Co, 48-23 32nd Pl, Long Island City, N. Y.

JACKS

Blackhawk Mfg Co, Milwaukee, Wis.
Buda Co, Harvey, Ill.
Dudgeon, Richard, Inc, 24 Columbia St, New York, N. Y.
Duff-Norton Mfg Co, Pittsburgh.
Elmes, Charles F, Engrg Works, N Morgan St, Chicago, Ill.
Graybar Electric Co, 420 Lexington Ave, New York, N. Y.
Adv pages 214, 234, 243, 261, 265, 282, 284
Joyce-Cridland Co, Dayton, Ohio
Marquette Mfg Co, 409 Johnson St, N E, Minneapolis, Minn.
Messenger Bearings, Inc, Philadelphia, Pa.
Templeton, Kenly & Co, 1020 S Central Ave, Chicago, Ill.
Watson-Stillman Co, Roselle, N. J.
Adv page 226
Williams, J H, & Co, 225 Lafayette St, New York, N. Y.

JOINTS, EXPANSION

Alberger Heater Co, 287 Chicago St, Buffalo, N. Y.
Alpha Tank & Sheet Metal Mfg Co, 5065 S 38th St, St Louis.
American District Steam Co, 70 Bryant St, N Tonawanda, N. Y.
Adv page 160
Badger, E B, & Sons Co, 75 Pitts St, Boston, Mass.
Badger Fire Extinguisher Co, Park Sq Bldg, Boston, Mass.
Belfield, H, Co, 435 N Broad St., Philadelphia, Pa.
Bordo, L J, Co, Glenside, Pa.
Chicago Metal Hose Corp, 1312 S 3rd Ave, Maywood, Ill.
Chiksan Tool Co, Brea, Cal.
Crane Co, 836 S Michigan Ave, Chicago, Ill.
Adv page 123
Croll-Reynolds Engrg Corp, 17 John St, New York, N. Y.
Dresser Mfg Co, Bradford, Pa.
Foster Wheeler Corp, 165 Broadway, New York, N. Y.
Adv pages 38, 39
Fulton Sylphon Co, Knoxville, Tenn.
Adv page 258
Harris, Arthur, & Co, 212 N Aberdeen St, Chicago, Ill.
Howard Iron Works, Buffalo, N. Y.
Illinois Engineering Co, Racine Ave & 21st St, Chicago, Ill.
Jarecki Mfg Co, Erie, Pa.
Kopperman, Joseph & Sons, 312-316 New St, Philadelphia, Pa.
Lunkenheimer Co, Box 360, Annex Station, Cincinnati, O.
Adv pages 221, 240, 275, 276, 278, 279, 280
National Valve & Mfg Co, 3102 Liberty Ave, Pittsburgh, Pa.
Adv page 200
Pittsburgh Valve & Fittings Corp, Barberton, Ohio
Powell, Wm, Co, Cincinnati, O.
Adv pages 166, 167
Ross Heater & Mfg Co, Inc, 1409 West Ave, Buffalo, N. Y.
Schade Valve Mfg Co, 2527 North Bodine St, Philadelphia, Pa.
Shaw, Benjamin F, Co, 509 E Second St, Wilmington, Del.
Adv page 35
Stearns-Roger Mfg Co, Denver, Colo.
U. S. Rubber Co, 1230 6th Ave, New York, N. Y.
Vapor Car Heating Co, 80 E Jackson Blvd, Chicago, Ill.
Walworth Co, Inc, 60 E 42nd St, New York, N. Y.
Adv pages 168, 169
Webster, Warren, & Co, Camden, N. J.
Adv page 272
Yarnall-Waring Co, Chestnut Hill, Philadelphia, Pa.
Adv page 109
Zallea Bros & Johnson, 820 Locust St, Wilmington, Del.

JOINTS, FLEXIBLE

Allis-Chalmers Mfg Co, Milwaukee, Wis.
Adv pages 6, 7
Barco Mfg Co, 1802½ Winnemac Ave., Chicago, Ill.
Bordo, L J, Co, Glenside, Pa.
Chicago Metal Hose Corp, 1312 S 3rd Ave, Maywood, Ill.
Chiksan Tool Co, Brea, Cal.
Crane Co, 836 S Michigan Ave, Chicago, Ill.
Adv page 123
Johnson Corp, 865 Wood St, Three Rivers, Mich.
Syntron Co, Homer City, Pa.
U S Pipe & Foundry Co, Burlington, N. J.
Vapor Car Heating Co, 80 E Jackson Blvd, Chicago, Ill.
Zallea Bros & Johnson, 820 Locust St, Wilmington, Del.

JOINTS, PIPE, BALL

Barco Mfg Co, 1802½ Winnemac Ave., Chicago, Ill.
Clow, James B, & Sons, 201-299 N Talman Ave, Chicago, Ill.
Crane Co, 836 S Michigan Ave, Chicago, Ill.
Adv page 123
Johnson Corp, 865 Wood St, Three Rivers, Mich.
Spraying Systems Co, 4021C W Lake St, Chicago, Ill.
Syntron Co, Homer City, Pa.
Vapor Car Heating Co, 80 E Jackson Blvd, Chicago, Ill.

LACING, BELT

Baldwin Belting & Leather Co, 85 Chambers St, New York, N. Y.
Bristol Co, Waterbury, Conn.
Clipper Belt Lacer Co, Front Ave, N W, Grand Rapids, Mich.
Crescent Belt Fastener Co, 247 Park Ave, New York, N. Y.
Detroit Belt Lacer Co, 3945-51 A St, Detroit, Mich.
Flexible Steel Lacing Co, 4607 Lexington St, Chicago, Ill.
Graton & Knight Co, Worcester, Mass.
Houghton, E F, & Co, 244-50 W Somerset St, Philadelphia, Pa.
Pennwell Oil & Belting Co, 5 White St, New York, N. Y.
Raniville, F, Co, Grand Rapids, Mich.
Rhoads, J E & Sons, 35 N 6th St, Philadelphia, Pa.
Safety Belt Lacer Co, Toledo, Ohio
Schieren, Chas A, Co, 30-39 Ferry St, New York, N. Y.
Schwartz Belting Co, 74 Murray St, New York, N. Y.
Talcott, W O & M W, Inc, 91 Sabin St, Providence, R. I.
Whiting Leather & Belting Co, 9 Murray St, New York, N. Y.
Williams, I B, & Son, 73 Murray St, New York, N. Y.

LAMP LOCKS

Laduby Co, 255 Bradley St, New Haven, Conn.

LARRIES

(See Also Scales)
Bartlett & Snow, C O, Co, Cleveland, Ohio
Beaumont-Birch Co, 1505 Race St, Philadelphia, Pa.
Bergen Point Iron Works, Bayonne, N. J.
Brady Conveyors Corp, 20 W Jackson Blvd, Chicago, Ill.
Buffalo Scale Co, 1200 Niagara St, Buffalo, N. Y.
Caldwell, W E, Co, 280 Brandeis St, Louisville, Ky.
Chain Belt Co, 1674 W Bruce St, Milwaukee, Wis.
Columbus Conveyor Co, Columhart St, Marion, Ohio
Gifford-Wood Co, 24 Hill St, Hudson, N. Y.
Heilman Boiler Works, Allentown, Pa.
Jeffrey Mfg Co, 932-99 N 4th St, Columbus, Ohio.
Link-Belt Co, 300 W Pershing Rd, Chicago, Ill.
Adv page 3
Richardson Scale Co, 690 Van Houten Ave, Clifton, N. J.
Robins Conveying Belt Co, Passaic, N. J.
Adv page 188
Stephens-Adamson Mfg Co, 5 Ridgeway Ave, Aurora, Ill.
Adv page 175
Stock Engrg Co, 9805 Theodore Ave, Cleveland, Ohio
Adv page 164
Webster Mfg Inc, Tiffin, Ohio
Wellman Engrg Co, 7000 Central Ave, Cleveland, Ohio

LATHES, ENGINE

American Tool Works Co, Cincinnati, Ohio
Atlas Press Co, Kalamazoo, Mich.
Hardinge Brothers, Inc, Elmira, N. Y.
Le Blond, R K, Machine Tool Co, Cincinnati, Ohio
Lodge & Shipley Machine Tool Co, Cincinnati, Ohio
Niles-Bement-Pond Co, Hartford, Conn.
Niles Tool Works Div, General Machinery Corp, Hamilton, Ohio
South Bend Lathe Works, South Bend, Ind.

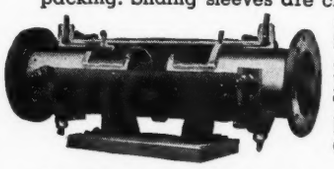
LEATHER PACKING

(See Packing, Leather)

LEATHERS, HYDRAULIC

Clayton Mark & Co, 1900 Dempster St, Evanston, Ill.
Excelsior Leather Washer Mfg Co, Rockford, Ill.
Garlock Packing Co, 400 Main St, Palmyra, N. Y.
Adv page 42
Graton & Knight Co, Worcester, Mass.
Himmelein & Bailey, Inc, 1300 Walnut St, Camden, N. J.
Houghton, E F, & Co, 244–250 W Somerset St, Phila, Pa.
Laurence Belting Co, 111 Chambers St, New York, N. Y.

YARWAY GUN-PAKT
EXPANSION JOINTS
Wrought steel, cylinder guided. Gun-pakt and Gland-pakt types. Gun-pakt *(illustrated)*, the most revolutionary Expansion Joint development of the decade, has screw guns for plastic packing; may be packed while under full pressure. Gland-pakt has ring type packing. Sliding sleeves are chromium plated. Single and double end styles, flanged and welding ends, 2" to 24". Also all-brass in smaller sizes. Thousands in use. Proved by years of service. Catalog EJ-1908.



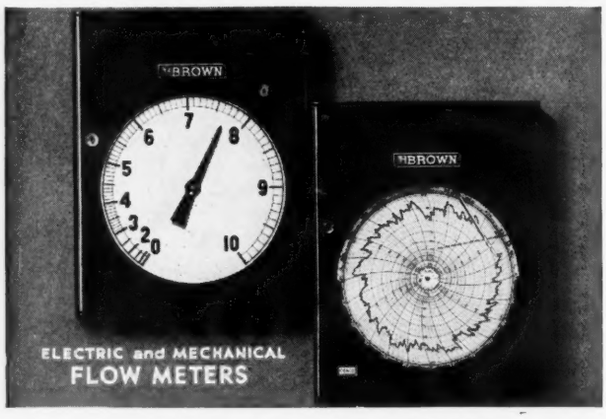
See other Yarway Advertisements on pages 109, 244, 275, 283
YARNALL-WARING COMPANY, 100 MERMAID AVE., PHILA.

FlexoDisc Expansion Joint
CROLL-REYNOLDS
The FlexoDisc Expansion Joint is made of alloy steel discs welded at their inner and outer edges by means of Atomic Hydrogen welding, making a bottle-tight, leak proof, and unusually flexible joint. It will handle both linear and lateral movement in steam lines and miscellaneous piping and industrial equipment.
CROLL-REYNOLDS ENGRG. CO.,
17 JOHN ST., NEW YORK, N. Y.

FLOW METERS by COCHRANE

Write for Bulletin #3010

COCHRANE CORPORATION, 3106 N. 17th ST., PHILA., PA.



For Controlling, Recording, Totalizing and Indicating the Flow of Steam, Water, Gas, Oil, etc.

Brown Flow Meters are available in two types, the Electric type and Mechanical type.

ELECTRIC TYPE: Complete equipment consists of three units, the orifice plate, manometer and instrument. Instrument can be located at a remote point from the orifice and manometer (point of flow measurement).

Because of this flexibility, it is particularly adaptable for applications where instruments are to be remotely located. Write for catalog D.

MECHANICAL TYPE: Complete equipment consists of two units, the orifice plate and the instrument. The meter body is integral with the instrument. Readings are transmitted mechanically from meter body to instrument. Write for catalog.

THE BROWN INSTRUMENT COMPANY, *a division of Minneapolis-Honeywell Regulator Co.*, 4490 Wayne Avenue, Philadelphia, Pa.

BROWN FLOW METERS

To Measure and Control is to Economize

Page Belting Co, Concord, N. H.
Philadelphia Belting Co, 6th & Spring Garden Sts, Phila, Pa.
Preston, Horace G, Co, Detroit.
Raniville, F, Co, Grand Rapids, Mich.
Rhoads, J E & Sons, 35 N 6th St, Philadelphia, Pa.
Robertson, John, Co, Inc, 133 Water St, Brooklyn, N. Y.
Schieren, Chas A, Co, 30-39 Ferry St, New York, N. Y.
Watson-Stillman Co, Roselle, N. J.
Adv page 226
Wayne Davies & Co, 325 W Huron St, Chicago, Ill.
Williams, I B, & Sons, 73 Murray St, New York, N. Y.
Whiting Leather & Belting Co, 9 Murray St, New York, N. Y.

LOCKNUTS

Elastic Stop Nut Corp, 2332 Vauxhall Rd, Union, N. J.
Laminated Shim Co, 61 Union St, Glenbrook, Conn.
National Screw & Mfg Co, 2440 E 75th St, Cleveland, Ohio.
Palnut Co, 64 Cordier St, Irvington, N. J.
Positive Lock Washer Co, Ave A & Miller St, Newark, N. J.
Scovill Mfg Co, 99 Mill St, Waterbury, Conn.
Adv page 111
Standard Pressed Steel Co, Jenkintown, Pa.

LOUVRES AND SHUTTERS

Air & Refrigeration Corp, 175 Fifth Ave, New York, N. Y.
Alpha Tank & Sheet Metal Mfg Co, 5005 S 38th St, St Louis, Mo.
American Warming & Ventilating Co, Toledo, Ohio
Arex Co, 333 N Michigan Ave, Chicago, Ill.
Barber Colman Co, Rockford, Ill.
Chelsea Fan & Blower Co, 1206 Grove St, Newark, N. J.
De Bothezat Ventilating Equipt Div, American Machine & Metals, East Moline, Ill.
Minneapolis-Honeywell Regulator Co, 2747 4th Ave S, Minneapolis, Minn.

LUNKENHEIMER

LUBRICATING DEVICES

BOTTLE OILERS

Automatically feed the right amount of oil, in the right way, to the right place. Provide Economy, Convenience, Cleanliness, Visibility.

Automatic Lubrication Visible Oil Reserve

"ALVOR" CONSTANT LEVEL OIL CONTROL

Maintains a constant oil level in ring oiled bearings. Insures against failure of oil supply and consequent costly shut-down of equipment.

Fig. 1300 "Sentinel" Oil Cup

OIL CUPS

A wide variety of types and sizes with and without sight feeds. Sturdily constructed to withstand vibration

GREASE CUPS

Made of bronze in a variety of sizes and types — compression, screw feed plunger and automatic. Fig. 513 "Tiger" compression type illustrated.

ESTABLISHED 1862
THE LUNKENHEIMER CO.
"QUALITY"
CINCINNATI, OHIO, U. S. A.

LOW-WATER ALARMS
(See Water Columns)

LUBRICATORS
Alemite Div, Stewart Warner Corp, 1826-1852 Diversey Pkwy, Chicago, Ill.
American Injector Co, Detroit. Mich.
Atlas Elevator Devices Co, 466 Brome St, New York, N. Y.
Bowser, S F, & Co, 1302 E Creighton Ave, Fort Wayne, Ind.
Detroit Lubricator Co, 5900 Trumbull Ave, Detroit, Mich.
Gardner-Denver Co, 100 Gardner Drive, Quincy, Ill.
Gits Bros Mfg Co, 1846 S Kilbourn Ave, Chicago, Ill.
Hills-McCanna Co, 3025 N Western Ave, Chicago, Ill.
Hunter Pressed Steel Co, 8000 Maple Ave, Lansdale, Pa.
Jarecki Mfg Co, Erie, Pa.
Lincoln Engrg Co, 5701 Natural Bridge, St Louis, Mo.
Logansport Machine, Inc, Logansport, Ind.
Lonergan, J E, Co, 211 Race St, Philadelphia, Pa.
Adv page 281
Lunkenheimer Co, Box 360, Annex Station, Cincinnati, O.
Adv pages 221, 240, 275, 276, 278, 279, 280
Madison-Kipp Corp, 201 Waubesa St, Madison, Wis.
Manzel Bros Co, 326 Babcock St, Buffalo, N. Y.
McCord Radiator & Mfg Co, Detroit, Mich.
Nathan Mfg Co, 250 Park Ave, New York, N. Y.
Norgren, C A, Co, 210 Santa Fe Drive, Denver, Colo.
Nugent, Wm W, & Co, 402 N Hermitage Ave, Chicago, Ill.
Ohio Grease Co, Loudonville, O.
Powell, Wm, Co, Cincinnati, O.
Adv pages 166, 167
Swift Lubricator Co, 330 James Bldg, Elmira, N. Y.
Trico Fuse Mfg Co, 2955 N 5th St, Milwaukee, Wis.
U. S. Metallic Packing Co, Hamilton St, Philadelphia, Pa.
Williams, D T, Valve Co, 2854 Spring Grove, Cincinnati, O.

MECHANICAL TRANSMISSIONS
(See Gear Units, Transmissions)

MEGOHMMETERS
Biddle, James G, Co, 1211-13 Arch St, Philadelphia, Pa.
Adv page 138

METAL ALLOYS
(See Alloys, Metals for Special Service)

METALLIC PACKING
(See Packing, Metallic)

METAL-SPRAY EQUIPMENT
(See Guns, Metal-Spray)

METERS, AIR, GAS
American Meter Co, Inc, 60 E 42nd St, New York, N. Y.
Bacharach Industrial Inst Co, 7000 Bennett, Pittsburgh, Pa.
Adv page 289
Bailey Meter Co, Inc, 1036 Ivanhoe Rd, Cleveland, Ohio.
Adv pages 14, 15
Bristol Co, Waterbury, Conn.
Brown Instrument Co, 4490 Wayne Ave, Philadelphia, Pa.
Adv pages 51, 240, 254, 258, 266
Builders-Providence Inc, 7 Codding St, Providence, R. I.
Adv page 242
Clark, Chas J, Blast Meter Co, Gladbrook, Iowa.
Cochrane Corp, 3106 N 17th St, Philadelphia, Pa.
Adv pages 154, 233, 240, 261, 269
Fischer & Porter Co, 60 County Line Rd, Hatboro, Pa.
Foxboro Co, 38 Neponset Ave, Foxboro, Mass.
Friez, Julien P, & Sons, 4 N Central Ave, Baltimore, Md.
Republic Flow Meters Co, 2222 Diversey Pkwy, Chicago, Ill.
Adv pages 215, 221, 241, 280
Schutte & Koerting Co, 12th & Thompson Sts, Phila, Pa.
Simplex Valve & Meter Co, 6780 Upland St, Philadelphia, Pa.

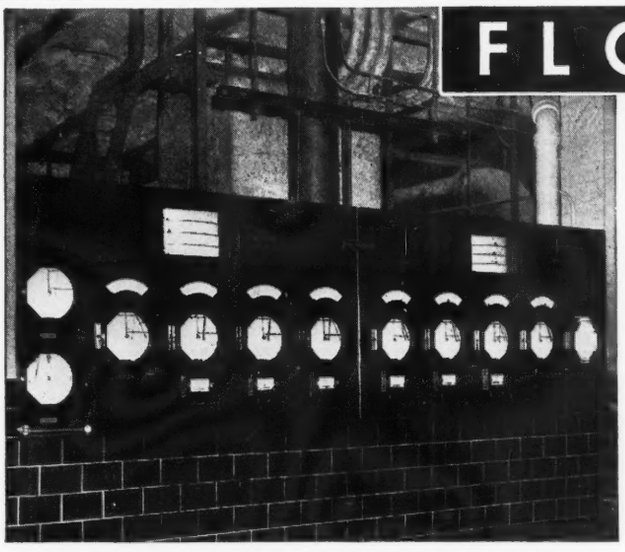
METERS, COAL
Bailey Meter Co, 1036 Ivanhoe Road, Cleveland, Ohio
Adv pages 14, 15
Beaumont Birch Co, 1505 Race St, Philadelphia, Pa.
Builders-Providence Inc, 7 Codding St, Providence, R. I.
Stock Engrg Co, 9805 Theodore Ave, Cleveland, Ohio
Adv page 164

METERS, CO_2
(See Analyzers, CO_2 and Recorders, CO_2)

METERS, FLOW
American District Steam Co, 70 Bryant St, N Tonawanda, N. Y.
Adv page 160
American Meter Co, Inc, 60 E 42nd St., New York, N. Y.
Bacharach Industrial Instrument Co, 7000 Bennett, Pittsburgh, Pa.
Adv page 289
Bailey Meter Co, 1036 Ivanhoe Road, Cleveland, Ohio
Adv pages 14, 15
Bristol Co, Waterbury, Conn.
Brown Instrument Co, 4490 Wayne Ave., Philadelphia, Pa.
Adv pages 51, 240, 254, 258, 266
Builders-Providence Inc, 7 Codding St, Providence, R. I.
Adv pages 242
Cochrane Corp, 3106 N 17th St, Philadelphia, Pa.
Adv pages 154, 233, 240, 261, 269
Corning Glass Works, Corning, N. Y.
Fischer & Porter Co, 60 County Line Rd, Hatboro, Pa.
Foxboro Co, 38 Neponset Ave, Foxboro, Mass.
Henszey Co, Dept D-14, Watertown, Wis.
Leeds & Northrup Co, 4970 Stenton Ave, Philadelphia, Pa.
Adv page 2nd cover
Mason-Neilan Regulator Co, 1186 Adams St, Boston, Mass.
Morey & Jones, Ltd, Room 1010, 922 S Hemlock St, Los Angeles, Calif.
Pfening, Fred D, Co, 1075 W 5th Ave, Columbus, O.
Republic Flow Meters Co, 2222 Diversey Pkwy, Chicago, Ill.
Adv pages 215, 221, 241, 280
Roots-Connersville Blower Corp, Connersville, Ind.
Schutte & Koerting Co, 12th & Thompson Sts, Philadelphia.
Simplex Valve & Meter Co, 6780 Upland St, Philadelphia, Pa.
Tagliabue, C J, Mfg Co, Park & Nostrand Aves, Brooklyn, New York.
Taylor Instrument Cos, Rochester, N. Y.

METERS, FREQUENCY
Biddle, James G, Co, 1211-13 Arch St, Philadelphia, Pa.
Adv page 138
Bristol Co, Waterbury, Conn.
General Electric Co, Schenectady, N. Y.
Adv pages 32, 33
Leeds & Northrup Co, 4970 Stenton Ave, Philadelphia, Pa.
Adv page 2nd cover
Roller-Smith Co, 1766 W Market St, Bethlehem, Pa.
Adv page 206
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61
Weston Electrical Instrument Corp, 614 Frelinghuysen Ave, Newark, N. J.
Adv pages 202, 267

METERS, FUEL-OIL
Alemite Div, 1826 W Diversey Pkwy, Chicago, Ill.
Bailey Meter Co, 1036 Ivanhoe Rd, Cleveland, Ohio
Adv pages 14, 15
Bowser, S F, & Co, Inc, 1302 E Creighton Ave, Fort Wayne, Ind.
Buffalo Meter Co, 2887 Main St, Buffalo, N. Y.
Fischer & Porter Co, 60 County Line Rd, Hatboro, Pa.
Foxboro Co, 38 Neponset Ave, Foxboro, Mass.
Granberg Equipment, Inc, 1308 67th St, Oakland, Calif.
Roots-Connersville Blower Corp, Connersville, Ind.



FLOW METERS

For Measuring the Flow of Steam-Water-Gas-Air-Oil

Do you have a means for easily and quickly checking the production and distribution of these power plant services? Do you know how much you are paying for steam or how economically it is being used? Republic flow meters will give you all the production and maintenance information you need in order to detect leaks and improve methods.

WORKING PRESSURES
Republic meters are available for all working pressures up to 5000 lb. per sq. in.

RANGE EASILY CHANGED
The range of a Republic meter can be easily and quickly changed by merely changing the range tube.

READING INSTRUMENTS
The Republic indicator, recorder and integrator operate independently of each other and can be supplied separately or in combination. They are remote reading.

EASILY READ
The indicator scale and the recorder chart all have uniform graduations and are direct reading. The integrator has a large cyclometer type dial.

TYPICAL INSTALLATIONS

ELI LILLY & CO.
MASONITE CORP.
THE VISCOSE CO.
STANDARD OIL CO.
QUAKER OATS CO.
MORTON SALT CO.
WESTERN ELECTRIC CO.
SHERWIN WILLIAMS CO.
WHEELING STEEL CORP.
CONSOLIDATED GAS CO.
CHEVROLET MOTORS CO.
ANHEUSER-BUSCH CO.

FOR COMPLETE DETAILS WRITE FOR DATA BOOK No. 701

REPUBLIC FLOW METERS CO. 2222 DIVERSEY PKWY. CHICAGO, ILLINOIS

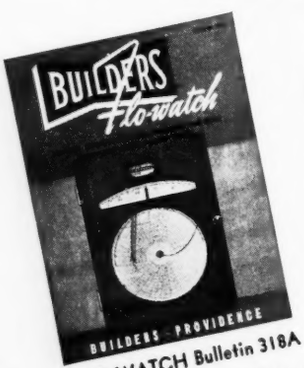
FOR OVER 50 YEARS

Sincerely yours *

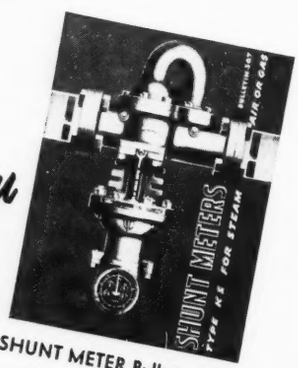
HAS BEEN PROUDLY INSCRIBED, IN EFFECT IF NOT IN FACT, ON THOUSANDS OF BUILDERS FLOW METERS AND CONTROLLERS!

Meter STEAM-

and get the most out of the steam you generate!



FLO-WATCH Bulletin 318A



SHUNT METER Bulletin 307

SEND FOR THE LATEST ON BUILDERS STEAM FLOW METERS

* Back in the old days, second-rate Roman sculptors who made unsightly nicks in the marble would secretly patch up the flaws with a mixture of wax and marble dust. These patches would drop out later on and honest artists suffered so much that they began labelling their handiwork "Sine Cera" (i. e. "Without Wax"); from this we derive our word "sincere" meaning honest, genuine, real.

ARMY E NAVY
AWARDED AUG. 1st. 1942

BUILDERS-PROVIDENCE, INC.

Est. 1820 • DIVISION OF BUILDERS IRON FOUNDRY • *Inc. 1853*

37 CODDING STREET • PROVIDENCE, R. I.

BUILDERS
RECORDING-INDICATING-CONTROLLING
Instruments

METERS, PH

Bristol Co, Waterbury, Conn.
Burrell Technical Supply Co, 1936 Fifth Ave, Pitsburgh, Pa.
Cambridge Instrument Co, 70 E 45th St, New York, N. Y.
Foxboro Co, 38 Neponset Ave, Foxboro, Mass.
Leeds & Northrup Co, 4970 Stenton Ave, Philadelphia, Pa.
Adv page **2nd cover**
National Technical Labs, 820 Mission St, S Pasadena, Cal.
Adv page 146
Taylor, W A, & Co, 7300 York Rd, Baltimore, Md.

METERS, PITOT-TUBE

Bacharach Industrial Instrument Co, 7000 Bennett, Pittsburgh, Pa.
Adv page 289
Brown Instrument Co, 4490 Wayne Ave, Philadelphia, Pa.
Adv pages 51, 240, 254, 258, 266
Ellison Draft Gage Co, 214 W Kinzie St, Chicago, Ill.
Foxboro Co, 38 Neponset Ave, Foxboro, Mass.
Friez, Julien P, & Sons, 4 N Central Ave., Baltimore, Md.
Simplex Valve & Meter Co, 6780 Upland St, Philadelphia, Pa.

METERS, WATER

Buffalo Meter Co, 2887 Main St, Buffalo, N. Y.
Builders-Providence Inc, 7 Codding St, Providence, R. I.
Adv page 242
Fischer & Porter Co, 60 County Line Rd, Hatboro, Pa.
Foxboro Co, 38 Neponset Ave, Foxboro, Mass.
Henszey Co, Dept D-14, Watertown, Wis.
Pfening, Fred D, Co, 1075 W 5th Ave, Columbus, O.
Republic Flow Meters Co, 2222 Diversey Pkwy, Chicago, Ill.
Adv pages 215, 221, 241, 280
Roots-Connersville Blower Corp, Connersville, Ind.
Simplex Valve & Meter Co, 6780 Upland St, Philadelphia, Pa.

METERS, WATTHOUR

(See Watthour Meters)

MIXERS, CHEMICAL

(See Water Treatment, Mixers)

MOTOR BASES

(See Bases, Motor)

MOTOR-GENERATORS

Allis-Chalmers Mfg Co, Milwaukee, Wis.
Adv pages 6, 7
Allis, Louis, Co, Milwaukee, Wis.
Bogue Electric Co, 80 Glover Ave, Paterson, N. J.
Burke Electric Co, 12th and Cranberry Sts, Erie Pa.
Century Electric Co, 1806 Pine St, St Louis, Mo.
Crocker-Wheeler Electric Mfg Co, Ampere, N. J.
Diehl Mfg Co, Elizabethtown.
Elliott Co, Ridgeway, Pa.
Adv pages 4, 5, 187
Erie Electric Co, 124 Church St, Buffalo, N. Y.
Fairbanks, Morse & Co, 600 S Michigan Ave, Chicago, Ill.
Forbes & Myers, 174 Union St, Worcester, Mass.
General Electric Co, Schenectady, N. Y.
Adv pages 32, 33
Graybar Electric Co, 420 Lexington Ave, New York, N. Y.
Adv pages 214, 234, 243, 261, 265 282, 284
Hanson-Van Winkle Munning Co, Matawan, N. J.
Ideal Electric & Mfg Co, Mansfield, Ohio
Janette Mfg Co, 556 W Monroe St, Chicago, Ill.
Reliance Electric & Engrg Co, 1068 Ivanhoe Rd, Cleveland, O.
Sturtevant, B F, Co, 47 Readville St, Boston, Mass.
Adv pages 40, 41
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61

MOTOR STARTERS, ELECTRIC AC & DC

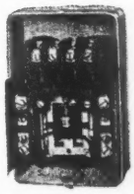
Allen-Bradley Co, Milwaukee, W
Allis-Chalmers Mfg Co, Milwaukee, Wis.
Adv pages 6, 7
Arrow-Hart & Hegeman Electric Co, 105 Hawthorne St, Hartford, Conn.
Clark Controller Co, 1146 E 152nd St, Cleveland, Ohio
Colt's Patent Fire Arms Mfg Co, Hartford, Conn.
Cutler-Hammer, Inc, 606 N 12th St, Milwaukee, Wis.
Adv pages 107
Electric Controller & Mfg Co, Cleveland, Ohio
General Electric Co, Schenectady, N. Y.
Adv pages 32, 33
Graybar Electric Co, 420 Lexington Ave, New York, N. Y.
Adv pages 214, 234, 243, 261, 265, 282, 284
Monitor Controller Co, Lombard & Gay Sts, Baltimore, Md.
Ohio Brass Co, Mansfield, Ohio
Rowan Controller Co, 2313 Homewood Ave, Baltimore.
Square D Co, Rivard & Piquette Sts, Detroit, Mich.
Sterling Electric Motors Inc, Los Angeles, Calif.
Ward Leonard Electric Co, 31 South St, Mount Vernon, N. Y.
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61

MOTORS, ADJUSTABLE SPEED, VARIABLE SPEED

Allis-Chalmers Mfg Co, Milwaukee, Wis.
Adv pages 6, 7
Allis, Louis, Co. Milwaukee,
Barber Colman Co, Rockford, Ill.
Bogue Electric Co, 80 Glover Ave, Paterson, N. J.
Century Electric Co, 1806 Pine St, St Louis, Mo.
Crocker-Wheeler Elec Mfg Co, Ampere, N. J.
Diehl Mfg Co, Elizabethport, N. J.
Fairbanks, Morse & Co, 600 S Michigan Ave, Chicago, Ill.
General Electric Co, Schenectady, N. Y.
Adv pages 32, 33
Howell Electric Motors Co, 671 Roosevelt St, Howell, Mich.

DISTRIBUTED BY

Graybar ELECTRIC COMPANY — IN OVER 80 PRINCIPAL CITIES



ONE ITEM OF THE GRAYBAR 60,000

We have readily available the right control apparatus for every power requirement.

Janette Mfg Co, 556 W Monroe St, Chicago, Ill.
Link-Belt Co, 2045 W Hunting Park Ave, Philadelphia, Pa.
Reliance Electric & Engineering Co, 1068 Ivanhoe Rd, Cleveland, Ohio
Sterling Electric Motors, Inc, Los Angeles, Calif.
Sturtevant, B F, Co, 47 Readville St, Boston, Mass.
Adv pages 40, 41
U S Electrical Motors, 200 E Slauson Ave, Los Angeles.
Wagner Electric Corp, St. Louis,
Wesche, B A, Electric Co, Cincinnati, Ohio
Westinghouse Electric & Mfg Co, East Pittsburgh, Pa.
Adv pages 60, 61

MOTORS, DC

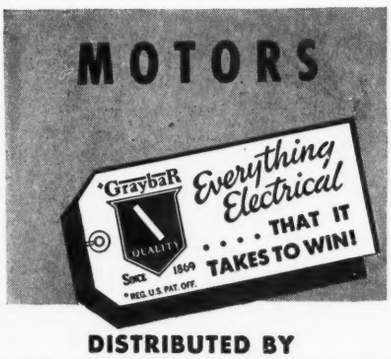
Allis-Chalmers Mfg Co, Milwaukee, Wis.
Adv pages 6, 7
Allis, Louis, Co, Milwaukee, Wis.
Bogue Electric Co, 80 Glover Ave, Paterson, N. J.
Burke Electric Co, 12th & Cranberry Sts, Erie, Pa.
Century Electric Co, 1806 Pine St, St Louis, Mo.
Columbia Elec Mfg Co, 4519 Hamilton Ave, Cleveland, Ohio
Crocker-Wheeler Elec Mfg Co, Ampere, N. J.
Diehl Mfg Co, Elizabethport, N. J.
Elliott Co, Jeannette, Pa.
Adv pages 4, 5, 187
Fairbanks, Morse & Co, 600 S Michigan Ave, Chicago, Ill.
General Electric Co, Schenectady, N. Y.
Adv pages 32, 33
Graybar Electric Co., 420 Lexington Ave., New York, N. Y.
Adv pages 214, 234, 243, 261, 265, 282, 284
Ideal Electric & Mfg Co, Mansfield, Ohio
Janette Mfg Co, 556 W Monroe St, Chicago, Ill.
Reliance Electric Engineering Co, 1068 Ivanhoe Rd, Cleveland, Ohio
Star Electric Motor Co, Bloomfield, N. J.
Adv page 243
Wagner Electric Corp, St Louis, Mo.
Wesche, B A, Electric Co, Cincinnati, Ohio
Westinghouse Electric & Mfg Co, East Pittsburgh, Pa.
Adv pages 60, 61

MOTORS, FRACTIONAL-HP

Barber Colman Co, Rockford, Ill.
Century Electric Co, 1806 Pine St, St Louis, Mo.
Diehl Mfg Co,Elizabethport, N. J.
General Electric Co, Schenectady, N. Y.
Adv pages 32, 33
Graybar Electric Co, 420 Lexington Ave, New York, N. Y.
Adv pages 214, 234, 243, 261, 265, 282, 284
Howell Electric Motors Co, 671 Roosevelt St, Howell, Mich.
Leland Electric Co, PO Box 1060, Dayton, Ohio
Janette Mfg Co, 556 W Monroe St, Chicago, Ill.
Ohio Electric Mfg Co, 5938 Maurice Ave, Cleveland, Ohio
Star Electric Motor Co, Bloomfield, N. J.
Adv page 243
Sterling Electric Motors, Inc, Los Angeles, Calif.
Sturtevant, B F, Co, 47 Readville St, Boston, Mass.
U S Electrical Motors, 200 E Slauson Ave, Los Angeles, Calif.
Wagner Electric Corp, St Louis, Mo.
Westinghouse Electric & Mfg Co, East Pittsburgh, Pa.
Adv pages 60, 61

MOTORS, INDUCTION

Allis-Chalmers Mfg Co, Milwaukee, Wis.
Adv pages 6, 7
Allis, Louis, Co, Milwaukee, Wis.
Bogue Electric Co, 80 Glover Ave, Paterson, N. J.



DISTRIBUTED BY

Graybar ELECTRIC COMPANY — IN OVER 80 PRINCIPAL CITIES

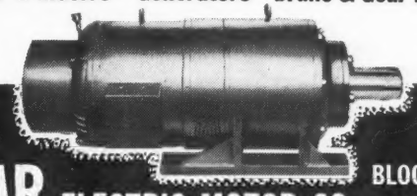
ONE ITEM OF THE GRAYBAR 60,000

General Purpose, Squirrel-Cage A.C. Slip-Ring and Repulsion D.C. Compound. Series. Shunt Fractional H.P. Motors—all G-E manufacture; all available from Graybar.

PLANETARY GEAR MOTORS

EQUIPPED WITH INTEGRAL MAGNETIC DISC BRAKE 1/4 TO 250 HORSEPOWER

A-C & D-C Motors * Generators * Brake & Gear Motors



STAR ELECTRIC MOTOR CO. BLOOMFIELD NEW JERSEY

ILLUSTRATED BULLETINS ON REQUEST

Century Electric Co, 1806 Pine St, St Louis, Mo.
Crocker-Wheeler Elec Mfg Co, Ampere, N. J.
Diehl Mfg Co, Elizabethport, N. J.
Elliott Co, Jeannette, Pa.
Adv pages 4, 5, 187
Fairbanks, Morse & Co, 600 S Michigan Ave, Chicago, Ill.
General Electric Co, Schenectady, N. Y.
Adv pages 32, 33
Graybar Electric Co, 420 Lexington Ave, New York, N. Y.
Adv pages 214, 234, 243, 261, 265, 282, 284
Howell Electric Motors Co, 671 Roosevelt St, Howell, Mich.
Ideal Electric & Mfg Co, Mansfield, Ohio
Janette Mfg Co, 556 W Monroe St, Chicago, Ill.
Reliance Electric & Engineering Co, 1068 Ivanhoe Rd, Cleveland, Ohio
Star Electric Motor Co, Bloomfield, N. J.
Adv page 243
Sterling Electric Motors, Inc, Los Angeles, Calif.
Sturtevant, B F, Co, 47 Readville St, Boston, Mass.
Adv pages 40, 41
U S Electrical Motors, 200 E Slauson Ave, Los Angeles, Calif.
Wagner Electric Corp, St Louis, Mo.
Wesche, B A, Electric Co, Cincinnati, Ohio
Westinghouse Electric & Mfg Co, East Pittsburgh, Pa.
Adv pages 60, 61

MOTORS, SYNCHRONOUS

Allis-Chalmers Mfg Co, Mil-
Adv pages 6, 7
Bogue Electric Co, 80 Glover Ave, Paterson, N. J.
Columbia Electric Mfg Co, 4519 Hamilton Ave, Cleveland, Ohio
Continental Electric Co, 321 Ferry St, Newark, N. J.
Crocker-Wheeler Elec Mfg Co, Ampere, N. J.
Delco Products, Dayton, Ohio.
Diehl Mfg Co, Elizabethport, N. J.
Electric Machinery Mfg Co, 1331 Tyler St, Minneapolis, Minn.
Elliott Co, Ridgeway, Pa.
Adv pages 4, 5, 187
Erie Electric Co, 124 Church St, Buffalo, N. Y.
Fairbanks, Morse & Co, 600 S Michigan Ave, Chicago, Ill.
Forbes & Myers, 174 Union St, Worcester, Mass.
General Electric Co, Schenectady, N. Y.
Adv pages 32, 33
Harnischfeger Corp, Milwaukee, Wis.
Howell Electric Motors Co, 671 Roosevelt St, Howell, Mich.
Ideal Electric & Mfg Co, Mansfield, Ohio
Imperial Electric Co, Akron, O.
Janette Mfg Co, 556 W Monroe St, Chicago, Ill.
Leland Electric Co, Dayton, O.
Master Electric Co, Dayton, O.
Onsrud Machine Works, Chicago, Ill.
Star Electric Motor Co, Bloomfield, N. J.
Adv page 243
Sterling Electric Motors, Inc, Los Angeles, Calif.
Sturtevant, B F, Co, 47 Reading St, Hyde Park, Boston, Mass.
Adv pages 40, 41
U. S. Elect Motors, Inc, 200 E Slauson Ave, Los Angeles, Cal.
Wagner Electric Corp, St Louis.
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61

MUFFLERS, INTAKE, EXHAUST

Air-Maze Corp, 5120 Harvard Ave, Cleveland, Ohio
Burgess Battery Co, Acoustic Div, 2815 W Roscoe St, Chicago, Ill.
Adv page 244
Engineering Specialties Co, 39 Cortland St, New York, N. Y.
Logansport Machine Inc, 914 Cotner Rd, Logansport, Ind.
Maxim Silencer Co, 85 Homestead Ave, Hartford, Conn.
Staynew Filter Corp, Rochester, N. Y.
Weber Engine Co, 12th & Winchester Sts, Kansas City, Mo.

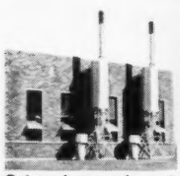
NOZZLES, SPRAY

Aldrich Pump Co, Allentown, Pa.
American Blower Corp, 6000 Russell St, Detroit, Mich.
Bayley Blower Co, 1817 S 66th St, Milwaukee, Wis.
Binks Mfg Co, 3114-40 Carroll Ave, Chicago, Ill.
Buffalo Forge Co, 488 Broadway, Buffalo, N. Y.
Adv page 199
Burhorn, Edwin, Co, 554 W 48th St, New York, N. Y.
Corning Glass Works, Dept IF, Corning, N. Y.
Deister Concentrator Co, Ft Wayne, Ind.
Eddington Metal Specialty Co, Box K, Eddington, Pa.
Adv pages 244, 252
Link-Belt Co, 300 W Pershing Rd, Chicago, Ill.
Adv page 3
Marley Co, Fairfax Rd & Marley Ave, Kansas City, Kan.
Adv page 268
Monarch Mfg Works, Inc, 2731 E Westmoreland St, Phila, Pa.
National Airoil Burner Co, 1284 E Sedgley Ave, Philadelphia, Pa.
Parks-Cramer Co, Fitchburg, Mass.
Ross Sprinkler Co, 34 Roberts St, Pasadena, Calif.
Schubert-Christy Corp, 1600 Georgia St, Affton Station, St Louis, Mo.
Schutte & Koerting Co, 12th & Thompson Sts, Philadelphia, Pa.
Spray Engrg Co, 111 Central St, Sommerville, Mass.
Spraying Systems Co, 4021-C W Lake St, Chicago, Ill.
Yarnall-Waring Co, Chestnut Hill, Philadelphia, Pa.
Adv pages 109, 239, 244, 275, 283
York Ice Machy Corp, York, Pa.

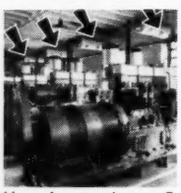
OBSERVATION PORTS, BOILER

Detroit Stoker Co, General Motors Bldg, Detroit, Mich.
Adv page 239
Fischer & Porter Co, 60 County Line Rd, Hatboro, Pa.

DIESEL ENGINES can be free from exhaust noise!



Quiet exhausts at Lamoni, Iowa, municipal plant.



No exhaust noise at E. Montpelier, Vermont.

Any Diesel engine can have a quiet exhaust if it is equipped with a Burgess Snubber. Snubbers *prevent* noise by "snubbing" high velocity slugs of exhaust gas to a quiet stream.

They are widely used in all types of power plants. Burgess Battery Company, Acoustic Division, 2823-P W. Roscoe St., Chicago, Illinois.

Burgess Snubber cutaway, showing typical snubbing section.

Snubbers on three big Diesels, Jasper, Texas.

—and at hundreds of other plants.

BURGESS
DIESEL EXHAUST
SNUBBERS

YARWAY
INVOLUTE
SPRAY NOZZLES

Non-clog design. Sizes ¼" to 2½". For general recooling and air conditioning service. Low pressures, fine spray, efficient operation. Installations total more than four million gallons per minute. Catalog N-616.

See other Yarway Advertisements on pages 109, 239, 275, 283

YARNALL WARING CO.
100 Mermaid Ave., Phila.

EDCO SPRAY NOZZLES

for RE-COOLING AND AIR-CONDITIONING

When the EDCO diamond is stamped on a spray nozzle or any other piece of equipment in the line—the engineers know that it had to be good to get thru a rigid inspection. Every EDCO tip is carefully checked for spray angle, atomization, and actual rated capacity. Industrial atomizing, cooling or washing operations that call for spray nozzles can be done better with EDCOS.

Furnished in stainless steel, bronze, nitralloy, monel, stoneware and hard rubber. Write today for illustrated Bulletin 3C1.

EDDINGTON METAL SPECIALTY CO.
P. O. Box K Eddington, Pa.

Laclede-Christy Clay Prod Co, 411 N Seventh, St Louis, Mo.
National Airoil Burner Co, 1284 E Sedgley Ave, Philadelphia, Pa.
Plibrico Jointless Firebrick Co, 1818 Kingsbury St, Chicago, Ill.
Adv pages 205, 206, 255, 282
Preferred Utilities Mfg Corp, New York, N. Y.

ODOR ADSORBERS

(See Adsorbers, Odor)

OHMMETERS

Biddle, James G, Co, 1211-13 Arch St, Philadelphia, Pa.
Adv page 138
Esterline-Angus Co, Box 596, Indianapolis, Ind.
General Electric Co, Schenectady, N. Y.
Adv pages 32-33
Leeds & Northrup Co, 4970 Stenton Ave, Philadelphia, Pa.
Adv page 2nd cover
Roller-Smith Co, 1766 W Market St, Bethlehem, Pa.
Adv page 206
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61
Weston Electrical Instrument Corp, 614 Frelinghuysen Ave, Newark, N. J.
Adv pages 202, 267

OIL BURNERS

(See Burners, Oil)

OIL-BURNING SYSTEMS, INDUSTRIAL

(See Also Burners, Oil)

Aeroil Burner Co, 5701 Park Avenue, W New York, N. Y.
Anthony Co, 47-33 5th St, Long Island City, N. Y.
Best, W N, Engrg Co, 90 West St, New York, N. Y.
Adv page 208
Engineer Co, 75 West St, New York, N. Y.
Adv page 185
Flinn & Dreffein Co, W Washington Blvd, Chicago, Ill.
Hadley, F V, Co, 127 Federal St, Boston, Mass.
Hauck Mfg Co, 126 10th St, Brooklyn, N. Y.
National Airoil Burner Co, 1284 E Sedgley Ave, Philadelphia, Pa.
Natural Gas Equipment Inc, 539 Petroleum Bldg, Los Angeles, Calif.
Peabody Engrg Corp, 580 5th Ave, New York, N. Y.
Adv page 153
Petroleum Heat & Power Co, Stamford, Conn.
Schutte & Koerting Co, 12th & Thompson Sts, Phila, Pa.
Simplex Oil Heating Corp, 191 Central Ave, Newark, N. J.
Staples & Pfeiffer Ltd, 528 Bryant St, San Francisco, Calif.
Stearns-Roger Mfg Co, Denver, Colo.
Tate-Jones & Co, 23 Broad St, Leetsdale, Pa.
Todd Combustion Equipment, 601 W 26th, New York, N. Y.
York Ice Machy Corp, York, Pa.

OIL RECLAIMERS

(See Purifiers, Oil)

OILING SYSTEMS, LUBRICATION

Alemite Div, Stewart Warner Corp, 1826-1852 Diversey Pkwy, Chicago, Ill.
Bowser, S F, & Co, 1302 E Creighton Ave, Fort Wayne, Ind.
Gits Bros Mfg Co, 1846 S Kilbourn Ave, Chicago, Ill.
Hills-McCanna Co, 3025 N Western Ave, Chicago, Ill.
Lunkenheimer Co, Box 360, Annex Station, Cincinnati, Ohio
Adv pages 221, 240, 275, 276, 278, 279, 280
Manzel Bros Co, 326 Babcock St, Buffalo, N. Y.
Nathan Mfg Co, 250 Park Ave. New York, N. Y.
Nugent, Wm W, & Co, Inc, 402 N Hermitage, Chicago, Ill.
Plouff Co, 1150 Columbus Ave, Boston, Mass.
Trico Fuse Mfg Co, 2955 No 5th St, Milwaukee, Wis.

OILS, FUEL

Arkansas Fuel Oil Co, Shreveport, La.
Cities Service Oil Co, 60 Wall Tower, New York, N. Y.
Deep Rock Oil Corp, Chicago, Ill.
Gulf Oil Corp, Gulf Bldg, Pittsburgh, Pa.
Adv page 143
Ohio Grease Co, Loudonville, Ohio
Petroleum Heat & Power Co, Stamford, Conn.
Pure Oil Co, 35 East Wacker Drive, Chicago, Ill.
Adv page 245
Shell Oil Co, 50 W 50th St, New York, N. Y.
Adv page 131
Sinclair Refining Co, 630 5th Ave, New York, N. Y.
Adv page 149
Socony-Vacuum Oil Co, Inc, 26 Broadway, New York, N. Y.
Standard Oil Co, Cal., 225 Bush St, San Francisco, Cal.
Standard Oil Co, Ind., 910 S Michigan Ave, Chicago, Ill.
Standard Oil Co, N. J., 26 Broadway, New York, N. Y.
Sun Oil Co, Philadelphia, Pa.
Adv page Third cover
Texas Co, 135 E 42nd St, New York, N. Y.
Adv pages 48, 49
Tidewater Assoc Oil Co, 17 Battery Place, New York, N. Y.
Valvoline Oil Co, 547 E 5th St, Cincinnati, Ohio

OILS, LUBRICATING

Acheson Colloids Corp, 3000 Washington Ave, Port Huron, Mich.
Alemite Div, Stewart Warner Corp, 1826-1852 Diversey Pkwy, Chicago, Ill.
Borne-Scrymser Co, 632 S Front St, Elizabeth, N. J.
Chard & Howe, 56-14 Nurge Ave, Maspeth, N. Y.
Cities Service Oil Co, 60 Wall Tower, New York, N. Y.
Deep Rock Oil Corp, Chicago, Ill.
Franklin Oil & Gas Co, Bedford, Ohio
Galena Oil Corp, 547 E 5th St, Cincinnati, Ohio
Gulf Oil Corp, Gulf Bldg, Pittsburgh, Pa.
Adv page 143
Harris, A W, Oil Co, Box 1295, Providence, R. I.
Houghton, E F, & Co, 244-50 W Somerset St, Phila, Pa.
Ilsley, Doubleday, & Co, 56-14 Nurge Ave, Maspeth, N. Y.
Kellogg, E H, & Co, 93 Water St, New York, N. Y.
Keystone Lubricating Co, 21st & Clearfield, Phila, Pa.
Lion Oil Refining Co, El Dorado, Ark.
Lubriplate Div, Fiske Bros Refining Co, 129 Lockwood St, Newark, N. J.
Macmillan Petroleum Corp, 530 W 6th St, Los Angeles, Calif.
Ohio Grease Co, Loudonville, O.
Ohio Oil Co, Findlay, Ohio
Pennzoil Co, Oil City, Pa.
Pure Oil Co, 35 East Wacker Drive, Chicago, Ill.
Adv page 245
Shell Oil Co, 50 W 50th St, New York, N. Y.
Adv page 131
Sinclair Refining Co, 630 5th Ave, New York, N. Y.
Adv page 149
Socony-Vacuum Oil Co, Inc, 26 Broadway, New York, N. Y.
Sonneborn, L, Sons, Inc, 88 Lexington Ave, New York, N. Y.
Standard Oil Co, Calif., 225 Bush St, San Francisco, Calif.
Standard Oil Co, Ind., 910 S Michigan Ave, Chicago, Ill.
Standard Oil Co, N. J., 26 Broadway, New York, N. Y.
Sun Oil Co, Philadelphia, Pa.
Adv page Third cover
Swan-Finch Oil Corp, RCA Bldg, W, New York, N. Y.
Texas Co, 135 E 42nd St, New York, N. Y.
Adv pages 48, 49
Tidewater Assoc Oil Co, 17 Battery Pl, New York, N. Y.
Valvoline Oil Co, 547 E 5th St, Cincinnati, Ohio
York Ice Machy Corp, York, Pa.

OILS, TRANSFORMER & SWITCH

Allis-Chalmers Mfg Co, Milwaukee, Wis.
Cities Service Oil Co, 60 Wall Tower, New York, N. Y.
Franklin Oil & Gas Co, Bedford, Ohio
General Electric Co, Schenectady, N. Y.
Adv pages 32, 33
Ilsley, Doubleday & Co, 56-14 Nurge Ave, Maspeth, N. Y.
Kellogg, E H & Co, 659 Water St, New York, N. Y.
Sun Oil Co, Philadelphia, Pa.
Adv page Third cover
Tidewater Assoc Oil Co, 17 Battery Pl, New York, N. Y.
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61

OPERATORS, DAMPER

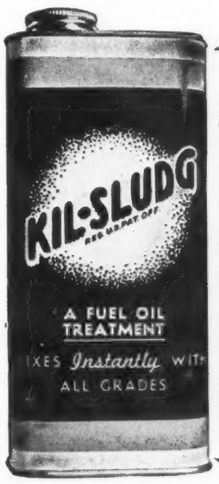
Barber Colman Co, Rockford, Ill.
Friez, Julien P, Div, 4 N Central Ave, Baltimore, Md.
General Controls Co, 810 Allen Ave, Glendale, Calif.
Hagan Corp, Hagan Bldg, Pittsburgh, Pa.
Adv pages 30, 31
Hotstream Heater Co, Cleveland, Ohio
Johnson Service Co, 507 E Michigan St, Milwaukee, Wis.
Mason-Neilan Regulator Co, 1186 Adams St, Boston, Mass.
Minneapolis-Honeywell Regulator Co, Minneapolis, Minn.
Triplex Heating Specialty Co, Peru, Ind.
Vapor Car Heating Co, 80 East Jackson Blvd, Chicago, Ill.

OPERATORS, MOTOR-VALVE

(See Valve Operators, Motor)

ORIFICES, RADIATOR

Dunham, C A, Co, 450 E Ohio St, Chicago, Ill.
Johnson Service Co, 507 E Michigan St, Milwaukee, Wis.
Sterling, Inc, Milwaukee, Wis.



SAVE FUEL OIL FOR VICTORY

By Treating it with **KIL-SLUDG**

Eliminate sludge conditions in tanks, pipe lines and preheaters with KIL-SLUDG and assure complete combustion of fuel oil.

KIL-SLUDG—specially compounded for effective treating of Fuel Oil. One customer reports: We find that it keeps the burner tips and heaters very clean and free from Sludg; in fact, where formerly we were using three heaters, we found we could cut down to two and still maintain our temperature

TRY IT TODAY!

Send trial order at once advising the nature of the sludge problem you want to solve. Ask for further details.

STANDARD CHEMICAL CO.
NATICK, MASS.

THE PURE OIL CO.
CHICAGO, U. S. A.

A complete line of
INDUSTRIAL PETROLEUM PRODUCTS
A Pure Oil engineer will help solve your lubrication problems. Write today.

THE PURE OIL COMPANY, U.S.A. PURE

Be sure with Pure

PACKING, ASBESTOS

Anchor Packing Co, 401 N Broad St, Philadelphia, Pa.
Belmont Packing & Rubber Co, East Butler & Sepviva Sts, Philadelphia, Pa.
Carey, Philip, Mfg Co, Lockland, O.
Adv page back cover
Cincinnati Rubber Mfg Co, 4901 Franklin Ave, Norwood, Cincinnati, Ohio
Collins Packing Co, 401 N Broad St, Philadelphia, Pa.
Adv page 246
Crane Packing Co, 1801 Cuyler Ave, Chicago, Ill.
Darcoid Co, Inc, 145 Sixth Ave, New York, N. Y.
Durabla Mfg Co, Room, 202, 114 Liberty St, New York, N. Y.
Ehret Magnesia Mfg Co, Inc. Valley Forge, Pa.
Adv page 157
Eureka Packing Co, 294–296 46th St, Brooklyn, N. Y.
Garlock Packing Co, 400 Main St, Palmyra, N. Y.
Adv page 42
Gatke Corp, 228 N La Salle St, Chicago, Ill.
Goetze Gasket & Packing Co, 10 Allen Ave, New Brunswick, N. J.
Goodrich, B F, Co, 460 S Main St, Akron, Ohio
Goodsell Packing Co, 1803 Belle Plaine Ave, Chicago, Ill.
Goodyear Tire & Rubber Co, 1144 E Market St, Akron, O.
Greene, Tweed & Co, 4377 Bronx Blvd, New York, N. Y.
Adv page 162
Jenkins Bros, 80 White St, New York, N. Y.
Johns-Manville, 22 E 40th St, New York, N. Y.
Adv pages 44, 45
Kensbey & Mattison Co, Butler Pike, Ambler, Pa.
Adv page 137
Klingerit, Inc, 16 Hudson St, New York, N. Y.
Adv page 279
Linear Packing & Rubber Co, State Rd & Levick St, Phila.
Mcirath Supply & Gasket Co, Tioga & Memphis Sts, Philadelphia, Pa.
New York Belting & Packing Co. Passaic, N. J.
Packing Engineering Corp, Cranford, N. J.
Raybestos-Manhattan Inc, Manheim, Pa.
Savage Packing & Engrg Co, 1029 Clinton St, Hoboken, N. J.
Sea-Ro Packing Co, Dept 1, Wood-Ridge, N. J.
Thermoid Rubber Div, Whitehead Rd, Trenton, N. J.
Union Asbestos & Rubber Co, 1821 S 54th Ave, Cicero, Ill.
Adv pages 204, 238, 248, 273
U. S. Rubber Co, 1230 6th Ave, New York, N. Y.
Vellumoid Co, 54 Rockdale St, Worcester, Mass.
Walker, James, Packing Co, 98 Liberty St, New York, N. Y.
Adv page 247

PACKING, FELT

American Felt Co, 315 4th Ave, New York, N. Y.
Booth Felt Co, 463 19th St, Brooklyn, N. Y.
Felters Co, Inc, Dept LM, 210 South St, Boston, Mass.
Johns-Manville, 22 E 40th St, New York, N. Y.
Adv pages 44, 45
Wayne Davies & Co, 325 W Huron St, Chicago, Ill.
Western Felt Works, 4117 Ogden Ave, Chicago, Ill.

PACKING, FIBRE

Allpax Co, Mamaroneck, N. Y.
Anchor Packing Co, 401 N Broad St, Philadelphia. Pa.
Cincinnati Rubber Mfg Co, 4901 Franklin Ave, Cincinnati, O.
Collins Packing Co, 401 N Broad St, Philadelphia, Pa.
Adv pages 246
Crane Packing Co, 1801 Cuyler Ave, Chicago, Ill.
Endura Mfg Co, Quakertown, Pa.
Fitzgerald Mfg Co, Torrington, Conn.
Garlock Packing Co, 400 Main St, Palmyra, N. Y.
Adv page 42
Goodsell Packing Co, 1803 Belle Plaine Ave, Chicago, Ill.
Greene, Tweed & Co, 4377 Bronx Blvd, New York, N. Y.
Adv page 162
Johns-Manville, 22 E 40th St, New York, N. Y.
Adv pages 44, 45
Thermoid Rubber Div, Whitehead Rd, Trenton, N. J.
Vellumoid Co, 54 Rockdale St, Worcester, Mass.

PACKING, FLAX

Anchor Packing Co, 401 N Broad St, Philadelphia, Pa.
Belmont Packing & Rubber Co, E Butler & Sepviva Sts, Philadelphia, Pa.
Collins Packing Co, 401 N Broad St, Philadelphia, Pa.
Adv page 246
Crane Packing Co, 1801 Cuyler Ave, Chicago, Ill.
Darcoid Co, Inc, 145 6th Ave, New York, N. Y.
Eureka Packing Co, 294–296 46th St, Brooklyn, N. Y.
Garlock Packing Co, 400 Main St, Palmyra, N. Y.
Adv page 42
Goetze Gasket & Packing Co, 10 Allen Ave, New Brunswick,, N. J.
Goodsell Packing Co, 1803 Belle Plaine Ave, Chicago, Ill.
Johns-Manville, 22 E 40th St, New York, N. Y.
Adv pages 44, 45
Linear Packing & Rubber Co, State Rd & Levick St, Phila, Pa.
Packing Engineering Corp, Cranford, N. J.
Savage Packing & Engrg Co, 1029 Clinton St, Hoboken, N. J.
Thermoid Rubber Div, Whitehead Rd, Trenton, N. J.
Union Asbestos & Rubber Co, 1821 So 54th Ave, Cicero, Ill.
Adv pages 204, 238, 248, 273
Walker, James, Packing Co, 98 Liberty St, New York, N. Y.
Adv page 247

PACKING, HEMP, JUTE

Anchor Packing Co, 401 N Broad St, Philadelphia, Pa.
Belmont Packing & Rubber Co, E Butler & Sepviva Sts, Philadelphia, Pa.
Collins Packing Co, 401 N Broad St, Philadelphia, Pa.
Adv page 246
Crane Packing Co, 1801 Cuyler Ave, Chicago, Ill.
Eureka Packing Co, 294–296 46th St, Brooklyn, N. Y.
Garlock Packing Co, 400 Main St, Palmyra, N. Y.
Adv page 42
Goetze Gasket & Packing Co, 10 Allen Ave, New Brunswick, N. J.
Goodsell Packing Co, 1803 Belle Plaine Ave, Chicago, Ill.
Johns-Manville, 22 E 40th St, New York, N. Y.
Adv pages 44, 45
Linear Packing & Rubber Co, State Rd & Levick St, Philadelphia, Pa.
Packing Engineering Corp, Cranford, N. J.
Thermoid Rubber Div, Whitehead Rd, Trenton, N. J.

PACKING, HYDRAULIC

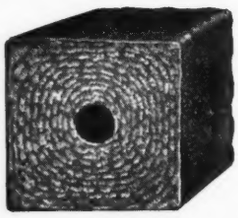
Anchor Packing Co, 401 N Broad St, Philadelphia, Pa.
Baldwin Belting & Leather Co, 85 Chambers St, New York, N. Y.
Belmont Packing & Rubber Co, E Butler & Sepviva Sts, Philadelphia, Pa.
Chicago Belting Co, Chicago, Ill.
Collins Packing Co, 401 N Broad St, Philadelphia, Pa.
Adv page 246
Crane Packing Co, 1801 Cuyler Ave, Chicago, Ill.
Darcoid Co, Inc, 145 6th Ave, New York, N. Y.

Top Production Efficiency calls for

COLLINS MECHANICAL PACKINGS

War production demands today call for mechanical packings that stand up against High Pressure Steam, Oil, Acids, Air, etc. Equipment that may have to last for the duration requires the best maintenance—and mechanical packings—available. Collins is able to help you do this job.

COLLINS BLACK CORE HIGH PRESSURE ROD PACKING



This closely woven asbestos cloth is wrapped around a non-vulcanizing rubber core; thoroughly lubricated and pliable. Will not score rod, nor harden, nor blow out. Also made of a wire inserted cloth for extreme conditions, especially for hot oil valve stems and similar service.

COLLINS DOUBLE-LIP PACKING

This labor saving, automatic-pressure packing double-seals at working pressure. Adaptable to a variety of uses, for sealing against steam, oil, acids and air at various pressures and temperatures.

GET OUR BOOKLET FOR YOUR WARTIME FILES; WRITE TODAY.

COLLINS MECHANICAL PACKINGS
PACKING CO., INC.
GENERAL OFFICES: 401 NO. BROAD ST.
PHILADELPHIA

Excelsior Leather Washer Mfg Co, Rockford, Ill.
Federal Metallic Packing Co, 29-99 Foundry St, Wakefield, Mass.
Garlock Packing Co, 400 Main St, Palmyra, N. Y.
Adv page 42
Gatke Corp, 228 N La Salle St, Chicago, Ill.
Goetze Gasket & Packing Co, 10 Allen Ave, New Brunswick, N. J.
Goodsell Packing Co, 1803 Belle Plaine Ave, Chicago, Ill.
Greene, Tweed & Co, 4377 Bronx Blvd, New York, N. Y.
Adv page 162
Houghton, E F & Co, 244-50 W Somerset St, Phila, Pa.
Johns-Manville, 22 E 40th St, New York, N. Y.
Adv pages 44, 45
Linear Packing & Rubber Co, State Rd & Levick St, Philadelphia, Pa.
Mabbs Hydraulic Packing Co, Manhattan Bldg, Chicago, Ill.
Marlo Co, 60 Grand St, New York, N. Y.
Packing Engineering Corp, Cranford, N. J.
Page Belting Co, Concord, N. H.
Philadelphia Belting Co, Spring Garden St., Philadelphia, Pa.
Quaker Rubber Corp, Comly & Milnor Sts, Phila, Pa.
Schieren, Chas A, Co, 30-39 Ferry St, New York, N. Y.
Sea-Ro Packing Co, Dept 1, Wood-Ridge, N. J.
Thermoid Rubber Div, Whitehead Rd, Trenton, N. J.
Walker, James, Packing Co, 98 Liberty St, New York, N. Y.
Adv page 247
Wayne Davies & Co. 325 W Huron St, Chicago, Ill.

PACKING, LEATHER

Alexander Bros, 410 N 3rd St, Philadelphia, Pa.
Anchor Packing Co. 401 N Broad St. Philadelphia. Pa.
Baldwin Belting & Leather Co, 85 Chambers, New York, N. Y.
Chicago Belting Co, Chicago, Ill.
Collins Packing Co, 401 N Broad St, Philadelphia, Pa.
Adv page 246
Excelsior Leather Washer Mfg Co, Rockford, Ill.
Garlock Packing Co, 400 Main St, Palmyra, N. Y.
Adv page 42
Graton & Knight Co, Worcester, Mass.
Houghton, E F, & Co, 244-50 W Somerset St, Phila, Pa.
Laurence Belting Co, 111 Chambers St, New York, N. Y.
Mabbs Hydraulic Packing Co, Manhattan Bldg, Chicago, Ill.
Page Belting Co, Concord, N. H.
Philadelphia Belting Co, 6th & Spring Garden Sts, Philadelphia, Pa.
Rhoads & Sons, J E, 35 N Sixth St, Philadelphia, Pa.
Schieren, Chas A. Co, 30-39 Ferry St, New York, N. Y.
Watson-Stillman Co, Roselle, N. J.
Adv page 226
Wayne Davies & Co, 325 W Huron St, Chicago, Ill.
Whiting Leather & Belting Co, 9 Murray St, New York, N. Y.

PACKING, METALLIC

Anchor Packing Co, 401 N Broad St, Philadelphia, Pa.
Belmont Packing & Rubber Co, E Butler & Sepviva Sts, Philadelphia, Pa.
Collins Packing Co, 401 N Broad St, Philadelphia, Pa.
Adv page 246
Conneaut Packing Co, 200 Main St, Conneaut, Ohio
Cook, C Lee, Mfg Co, 916 S 8th St, Louisville, Ky.
Crane Packing Co, 1801 Cuyler Ave, Chicago, Ill.
Durametallic Corp, Kalamazoo, Mich.
Ehret Magnesia Mfg. Co, Inc, Valley Forge, Pa.
Adv page 157
Eureka Packing Co. 294–296 46th St, Brooklyn, N. Y.
France Packing Co, 6512 Tacony St, Tacony, Philadelphia, Pa.
Garlock Packing Co. 400 Main St, Palmyra, N. Y.
Adv page **42**
Goetze Gasket & Packing Co, 10 Allen Ave, New Brunswick, N. J.
Goodsell Packing Co, 1803 Belle Plaine Ave, Chicago, Ill.
Holmes Metallic Packing Co, 45 Westminster, Wilkes - Barre, Pa.
Huhn Mfg Co, 1395 Sedgwick Ave, New York, N. Y.
Johns-Manville, 22 E 40th St, New York, N. Y.
Adv pages 44, 45
Koppers Co, Pittsburgh, Pa.
Marlo Co, 60 Grand St, New York, N. Y.
Mellor Packing Mfg Co, 332 Ocean Ave, Jersey City, N. J.
Metalastic Mfg Corp, 566 Broad St, Glen Rock, N. J.
National Engrg Products, Inc, Commerce & Savings Bldg, Washington, D. C.
Packing Engineering Corp, Cranford, N. J.
Rodpak Mfg Co, 1161 Folsom St, San Francisco, Calif.
Savage Packing & Engrg Co, 1029 Clinton St, Hoboken, N. J.
Thermoid Rubber Div, Whitehead Rd, Trenton, N. J.
Tripp Metallic Packing Co, Washington St, Boston, Mass.
Adv page 288

PACKING, RUBBER

Anchor Packing Co, 401 N Broad St, Philadelphia, Pa.
Belmont Packing & Rubber Co, E Butler & Sepviva Sts, Phila, Pa.
Chesterton, A W, Co, 64 India St, Boston, Mass.
Chicago Belting Co, Chicago, Ill.
Cincinnati Rubber Mfg Co, 4901 Franklin Ave, Cincinnati, O.
Collins Packing Co, 401 N Broad St, Philadelphia, Pa.
Adv page 246
Continental Rubber Works, Erie, Pa.
Crane Packing Co, 1801 Cuyler Ave, Chicago, Ill.
Darcoid Co, Inc, 145 6th Ave, New York, N. Y.
Eureka Packing Co, 294–296 46th St, Brooklyn, N. Y.
Garlock Packing Co, 400 Main St, Palmyra, N. Y.
Adv page 42
Gates Rubber Co, 999 S Broadway, Denver, Colo.
Goetze Gasket & Packing Co, 10 Allen Ave, New Brunswick, N. J.
Goodrich, B F, Co, 460 S Main St, Akron, Ohio
Goodsell Packing Co, 1803 Belle Plaine Ave, Chicago, Ill.
Goodyear Tire & Rubber Co, 1144 E Market St, Akron, O.
Hewitt Rubber Corp, Buffalo, N. Y.
Jenkins Bros, 80 White St, New York, N. Y.
Johns-Manville, 22 E 40th St, New York, N. Y.
Adv pages 44, 45
Linear Packing & Rubber Co, State Rd & Levick St, Phila, Pa.
Manhattan Rubber Mfg Div, 94 Townsend St, Passaic, N. J.
New York Belting & Packing Co, Passaic, N. J.
Packing Engineering Corp, Cranford, N. J.
Pioneer Rubber Mills, 345 Sacramento St, San Francisco, Cal.
Quaker Rubber Corp, Comly & Milnor Sts, Philadelphia, Pa.
Republic Rubber Div, Lee Tire & Rubber Corp, Youngstown Ohio
Schieren, Chas A, Co, 30-39 Ferry St, New York, N. Y.
Sexauer, J A, Mfg Co, 2503 Third Avenue, New York, N. Y.
Thermoid Rubber Div, Whitehead Rd, Trenton, N. J.
U. S. Rubber Co, 1230 6th Ave, New York, N. Y.
Walker, James, Packing Co, 98 Liberty St, New York, N. Y.
Adv page 247
Western Rubber Co, Goshen, Ind.

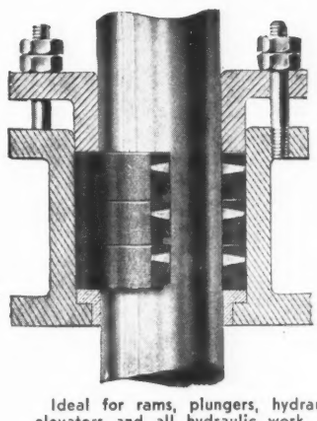
PACKING, SEMI-METALLIC

Albay Co, Inc, Mamaroneck, N. Y.
Anchor Packing Co, 401 N Broad St, Philadelphia, Pa.
Belmont Packing & Rubber Co, E Butler & Sepviva Sts, Phila.
Collins Packing Co, 401 N Broad St, Philadelphia, Pa.
Adv page 246
Crane Packing Co, 1801 Cuyler Ave, Chicago, Ill.
Darcoid Co, Inc, 145 6th Ave, New York, N. Y.
Durametallic Corp, Kalamazoo, **Mich.**
Eureka Packing Co, 294–296 46th St, Brooklyn, N. Y.
Federal Metallic Packing Co, 29-99 Foundry St, Wakefield, Mass.
France Packing Co, 6512 Tacony St, Tacony, Philadelphia, Pa.
Garlock Packing Co, 400 Main St, Palmyra, N. Y.
Adv page 42
Goodsell Packing Co, 1803 Belle Plaine Ave, Chicago, Ill.
Johns-Manville, 22 E 40th St, New York, N. Y.
Adv pages 44, 45
Linear Packing & Rubber Co, State Rd & Levick St, Phila.
Marlo Co, 60 Grand St, N. Y.
Metalastic Mfg Corp, 566 Broad St, Glen Rock, N. J.
New York Belting & Packing Co, Market St, Passaic, N. J.
Packing Engineering Corp, Cranford, N. J.
Rains Wood-Metal Packings, Spokane, Wash.
Sea-Ro Packing Co, Dept 1, Wood-Ridge, N. J.
Thermoid Rubber Div, Whitehead Rd, Trenton, N. J.
Union Asbestos & Rubber Co, 1821 S 54th Ave, Cicero, Ill.
Adv pages 204, 238, 248, 273
U. S. Rubber Co, 1230 6th Ave, New York, N. Y.
Walker, James, Packing Co, 98 Liberty St, New York, N. Y.
Adv page 247

PACKING, SHEET

Anchor Packing Co, 401 N Broad St, Philadelphia, Pa.
Belmont Packing & Rubber Co, E Butler & Sepviva Sts, Phila.
Cincinnati Rubber Mfg Co, 4901 Franklin Ave, Cincinnati, O.
Collins Packing Co, 401 N Broad St, Philadelphia, Pa.
Adv page 246
Continental Rubber Works, Erie, Pa.
Crane Packing Co, 1801 Cuyler Ave, Chicago, Ill.
Darcoid Co, Inc, **145 6th Ave, New York, N. Y.**
Durabla Mfg Co, Room 202, 114 Liberty St, New York, N. Y.
Eureka Packing Co, 294–296 46th St, Brooklyn, N. Y.
Garlock Packing Co, 400 Main St, Palmyra, N. Y.
Adv page 42
Gatke Corp, 228 N La Salle St, Chicago, Ill.
Goetze Gasket & Packing Co, 10 Allen Ave, New Brunswick, N. J.
Goodrich, B F, Co, 460 S Main St, Akron, Ohio
Goodsell Packing Co, 1803 Belle Plaine Ave, Chicago, Ill.
Goodyear Tire & Rubber Co, 1144 E Market St, Akron, O.
Greene, Tweed & Co, 4377 Bronx Blvd, New York, N. Y.
Adv page 162
Jenkins Bros, 80 White St, N. Y.
Johns-Manville, 22 E 40th St, New York, N. Y.
Adv pages 44, 45
Keasbey & Mattison Co, Butler Pike, Ambler, Pa.
Adv page 137
Klingerit, Inc, 16 Hudson St, New York, N. Y.
Adv page 279
Linear Packing & Rubber Co, State Rd & Levick St, Phila.
Melrath Supply & Gasket Co, Tioga & Memphis Sts, Phila.
Packing Engineering Corp, Cranford, N. J.
Pioneer Rubber Mills, 345 Sacramento St, San Francisco.
Quaker Rubber Corp, Comly & Milnor Sts, Phila, Pa.
Savage Packing & Engrg Co. 1029 Clinton St, Hoboken, N. J.
Sea-Ro Packing Co, Dept 1, Wood-Ridge, N. J.

WALKER'S "LION"
AUTOMATIC HYDRAULIC PACKING



...for highest hydraulic pressures

Scientifically designed so that the working pressure to which it is subjected actually makes it tight. Is molded with lip on working face which expands under working pressure to hug ram or plunger and prevent leakage. Face of packing studded with Anti-Friction Metal pins which reduce friction to a minimum.

Ideal for rams, plungers, hydraulic presses, accumulators, pumps, elevators and all hydraulic work. Available in spiral form in sizes from ½ in. and up or in rings to size of rod or ram. Sample sent on request.

Walker Packings of every description are available for all purposes.

WALKER'S LION PACKING

The James Walker Packing Co., Inc.
96 Liberty Street • New York, N. Y.

Thermoid Rubber Div, Whitehead Rd, Trenton, N. J.
U. S. Rubber Co, 1230 6th Ave, New York, N. Y.
Vellumoid Co, 54 Rockdale St, Worcester, Mass.
Victor Mfg & Gasket Co, 5750 Roosevelt Rd, Chicago, Ill.
Walker, James, Packing Co, 98 Liberty St, New York, N. Y.
Adv page 247

PAINT, ALUMINUM

Acme White Lead & Color Works, Detroit, Mich.
Aluminum Industries, Inc, 2416-38 Beekman St, Cincinnati, O.
American-Marietta Co, 43 E Ohio St, Chicago, Ill.
Eimer & Amend, 635 Greenwich St, New York, N. Y.
Hommel, O, & Co, 209 4th Ave, Pittsburgh, Pa.
Koppers Co, Pittsburgh, Pa.
Quigley Co, 56 W 45th St, New York, N. Y.
Sherwin-Williams Co, Prospect Ave, Cleveland, Ohio
Skybryte Co, Cleveland, Ohio
Socony-Vacuum Oil Co, 26 Broadway, New York, N. Y.
Thurmalox Co, 3109 N Broad St, Philadelphia, Pa.
Tropical Paint & Oil Co, Cleveland, Ohio
Wailes Dove-Hermiston Corp, Westfield, N. J.
White Co, 3200 E Biddle St, Baltimore, Md.

PAINT, BITUMINOUS-BASE

Acme White Lead & Color Works, Detroit, Mich.
American-Marietta Co, 43 E Ohio St, Chicago, Ill.
Carey, Philip, Mfg Co, Lockland, O.
Adv page back cover
Cork Import Corp, 330 W 42nd St, New York, N. Y.
Dampney Co of America, 1243 River St, Hyde Park, Mass.
Flintkote Co, 30 Rockefeller Plaza, New York, N. Y.
Ilsley-Doubleday & Co, 56-14 Nurge Ave, Maspeth, N. Y.
Inertol Co, 470 Frelinghuysen Ave, Newark, N. J.
Koppers Co, Pittsburgh, Pa.
North American Fibre Prod Co, Cleveland, Ohio
Quigley Co, 56 W 45th St, New York, N. Y.
Sherwin-Williams Co, Cleveland, Ohio
Socony-Vacuum Oil Co, 26 Broadway, New York, N. Y.
Standard Oil Co, Calif, 225 Bush St, San Francisco, Calif.
Thurmalox Co, 3109 N Broad St, Philadelphia, Pa.
Tropical Paint & Oil Co, Cleveland, Ohio
Vita-Var Corp, Newark, N. J.
Wailes Dove-Hermiston Corp, Westfield, N. J.

PAINT, BOILER-DRUM

(See Coatings, Boiler-Drum & Tubes)

PAINT, HEAT-RESISTANT

Acme White Lead & Color Works, Detroit, Mich.
Aluminum Industries Inc, 2416-38 Beekman St, Cincinnati, O.
American-Marietta Co, 43 E Ohio St, Chicago, Ill.
Arco Co, 7301 Bessemer Ave, Cleveland, Ohio
Brown, David C, Co, 17532 Wisconsin, Detroit, Mich.
Cheesman-Elliot Co, 647 Kent Ave, Brooklyn, N. Y.
Dampney Co of America, 1243 River St, Hyde Park, Mass.
Dixon, Joseph, Crucible Co, 170 Wayne St, Jersey City, N. J.
Adv page 186
Eimer & Amend, 635 Greenwich St, New York, N. Y.
Inertol Co, 470 Frelinghuysen Ave, Newark, N. J.
Quigley Co, 56 W 45th St, New York, N. Y.
North American Fibre Prod Co, Cleveland, Ohio
Sherwin-Williams Co, Cleveland, Ohio
Socony-Vacuum Oil Co, 26 Broadway, New York, N. Y.
Thurmalox Co, 3109 N Broad St, Philadelphia, Pa.
Tropical Paint & Oil Co, Cleveland, Ohio
Vita-Var Corp, Newark, N. J.
Wailes Dove-Hermiston Corp, Westfield, N. J.
White Co, 3200 E Biddle St, Baltimore, Md.

PAINT, INDUSTRIAL

Acme White Lead & Color Works, Detroit, Mich.
Aluminum Industries Inc, 2416-38 Beekman St, Cincinnati, O.
American-Marietta Co, 43 E Ohio St, Chicago, Ill.
Arco Co, 7301 Bessemer Ave, Cleveland Ohio
Barrett Co, 40 Rector St, New York, N. Y.
Brunner Mfg Co, 1821 Broad St, Utica, N. Y.
Dampney Co of America, 1243 River St, Hyde Park, Boston, Mass.
Goodrich, B F, Co, 460 S Main St, Akron, Ohio
Inertol Co, 470 Frelinghuysen Ave, Newark, N. J.
Keystone Varnish Co, 71 Otsego St, Brooklyn, N. Y.
Koppers Co Pittsburgh, Pa.
National Lead Co, 111 Broadway, New York, N. Y.
North American Fibre Prod Co, Cleveland, Ohio
Quigley Co, Inc, 56 W 45th St, New York, N. Y.
Saverite Engineering Co, 1031 Clinton St, Newark, N. J.
Sherwin-Williams Co, Cleveland, Ohio
Skybryte Co, Cleveland, Ohio
Socony-Vacuum Oil Co, 26 Broadway, New York, N. Y.
Standard Oil Co, Calif, 225 Bush St, San Francisco, Calif.
Thurmalox Co, 3109 N Broad St, Philadelphia, Pa.
Tropical Paint & Oil Co, Cleveland, Ohio
Truscon Laboratories, Detroit, Mich.
Vita-Var Corp, Newark, N. J.
Wailes Dove-Hermiston Corp, Westfield, N. J.

PAINT-SPRAY EQUIPMENT

American Brake Shoe & Foundry, Kellogg Div, Rochester, N. Y.
Brunner Mfg Co, 1821 Broad St, Utica, N. Y.
The DeVilbiss Co, Toledo, Ohio
Hommel, O, & Co, 209 4th Ave, Pittsburgh, Pa.
Macleod Co, 2236 Bogen St, Cincinnati, Ohio
Spray Engrg Co, 111 Central St, Somerville, Mass.

PIPE, ACID-, ABRASION-RESISTANT

Brown, David C, Co, 17532 Wisconsin, Detroit, Mich.
Corning Glass Works, Dept IP, Corning, N. Y.
Duriron Co, Inc, Dayton, Ohio
Haynes Stellite Co, Kokomo, Ind.
Johns-Manville, 22 E 40th St, New York, N. Y.
Adv pages 44, 45
Manhattan Rubber Mfg Div, 94 Townsend St, Passaic, N. J.
National Carbon Co, Carbon Sales Div, Cleveland, Ohio
National Lead Co, 111 Broadway, New York, N. Y.
Pfaudler Co, Rochester, N. Y.
Shaw, Benjamin F, Co, 509 E 2nd St, Wilmington, Del.
Adv page 35
U. S. Stoneware Co, 62 E 42nd St, New York, N. Y.
Walworth Co, Inc, 60 E 42nd St, New York, N. Y.
Adv pages 168, 169

PIPE, BRASS AND COPPER

American Brass Co, Waterbury, Conn.
Adv page 121
Bridgeport Brass Co, 30 Grand St, Bridgeport, Conn.
Chase Brass & Copper Co, 236 Grand St, Waterbury, Conn.
Crane Co, 836 S Michigan Ave, Chicago, Ill.
Adv page 123
Foster Wheeler Corp, 165 Broadway, New York, N. Y.
Adv pages 38, 39
Limbert, Geo B, & Co, 570 Fulton St, Chicago, Ill.
Mueller Brass Co, 1925 A Lapeer Ave, Port Huron, Mich.
Phelps Dodge Copper Products Corp, 40 Wall St, New York, N. Y.
Revere Copper & Brass Inc, 230 Park Ave, New York, N. Y.
Adv pages 20, 21
Scovill Mfg Co, Waterbury, Conn.
Adv page 111
Shaw, Benjamin F, Co, 509 E 2nd St, Wilmington, Del.
Adv page 35
Wolverine Tube Co, Detroit, Mich.

PIPE, CAST-IRON

American Cast Iron Pipe Co, Birmingham, Ala.
Clow, James B & Sons, 201-299 N Talman Ave, Chicago, Ill.
Crane Co, 836 S Michigan Ave, Chicago, Ill.
Adv page 123
Koppers Co, Pittsburgh, Pa.
Limbert, Geo B, & Co, 570 Fulton St, Chicago, Ill.
U. S. Pipe & Foundry Co, Burlington, N. J.
Walworth Co, Inc, 60 E 42nd St, New York, N. Y.
Adv pages 168, 169
Warren Foundry & Pipe Corp, 11 Broadway, New York, N. Y.
Wood, R D, & Co, Chestnut St, Philadelphia, Pa.

PIPE COILS

See Coils, Pipe, Tubing)

PIPE, HARD-RUBBER

American Hard Rubber Co, 11 Mercer St, New York, N. Y.
Goodrich, B F, Co, 460 S Main St, Akron, Ohio
U. S. Rubber Co, 1230 6th Ave, New York, N. Y.

PIPE-JOINT COMPOUND

(See Compound, Pipe-Joint)

PIPE JOINTS

(See Joints, Pipe, Ball)

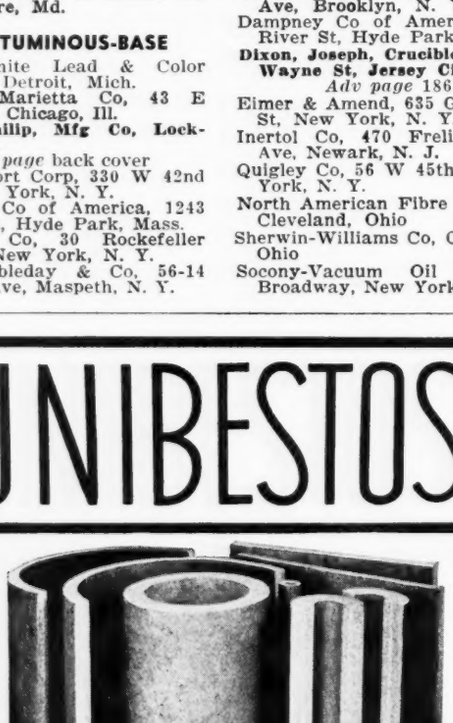
PIPE, SPIRAL-RIVETED, WELDED

American Locomotive Co, 30 Church St, New York, N. Y.
Adv pages 56, 155
American Rolling Mill Co, 700 Curtis St, Middletown, Ohio
Bethlehem Steel Co, Bethlehem, Pa.
Connery Construction Co, 2nd & Luzerne Sts, Phila, Pa.
Graver Tank & Mfg Co, Inc, East Chicago, Ind.
Koppers Co, Pittsburgh, Pa.
Limbert, Geo B, & Co, 570 Fulton St, Chicago, Ill.
Shaw, Benjamin F, Co, 509 E 2nd St, Wilmington, Del.
Adv page 35
Taylor Forge & Pipe Works, Box 485, Chicago, Ill.
Adv page 198
Treadwell Construction Co, Midland, Pa.

PIPE, STEEL

Allegheny Ludlum Steel Corp, Pittsburgh, Pa.
American Locomotive Co, 30 Church St, New York, N. Y.
Adv pages 56, 155
American Rolling Mill Co, 700 Curtis St, Middletown, Ohio
American Welding Co, 30 Church St, New York, N. Y.
Bethlehem Steel Co, Bethlehem, Pa.
Byers, A M, Co, Pittsburgh, Pa.
Adv page 62
Chicago Bridge & Iron Co, 2454 McCormick Bldg, Chicago, Ill.
Cohoes Rolling Mill Co, Cohoes, N. Y.
Crane Co, 836 S Michigan Ave, Chicago, Ill.
Adv page 123
Globe Steel Tubes Co, 4051 W Burnham St, Milwaukee, Wis.
Adv page 151
Jones & Laughlin Steel Corp, Pittsburgh, Pa.
Koppers Co, Pittsburgh, Pa.
Limbert, Geo B, & Co, 570 Fulton St, Chicago, Ill.
National Tube Co, Pittsburgh, Pa.
Petroleum Iron Works Div, Beaumont, Texas

UNIBESTOS



UNIBESTOS Heat Insulation takes hard knocks without denting or shattering. Unaffected by vibration. Highly resistant to moisture damage—no sagging. No calcination, no shrinkage nuisance even when used up to full temperature limits. UNIBESTOS is offered in a complete range of sizes: sectional insulation for all pipe diameters up to 36", thicknesses up to 5". Sheets up to 36" x 36" x 5". Available in 750° F. or 1200° F. material, or any combination of the two in single layer construction for any intermediate temperature. Fast, easy application often permits worthwhile savings on total installed cost. Send for samples and literature.

UNARCO
UNION ASBESTOS & RUBBER CO.
1811 S. 54th Ave., Cicero, Illinois
CHICAGO—310 S. Michigan Ave. NEW YORK—420 Lexington Ave.
SAN FRANCISCO—116 New Montgomery St.
Contractor-Distributors Located in Principal Industrial Centers

Pittsburgh Des Moines Steel Co, Neville Island, Pittsburgh, Pa.
Revere Copper & Brass Inc, 230 Park Ave, New York, N. Y.
Ryerson, Jos T, & Son, 16th & Rockwell Sts, Chicago, Ill.
Shaw, Benjamin F, Co, 509 E 2nd St, Wilmington, Del.
Adv page 35
South Chester Tube Co, Front & Thurlow Sts, Chester, Pa.
Steel & Tubes Div, Republic Steel Corp, 218 E 131st St, Cleveland, Ohio
Wheeling Steel Corp, Wheeling, W. Va.
Willamette Iron & Steel Corp, Portland, Ore.
Youngstown Sheet & Tube Co, Youngstown, Ohio
Adv page 189

PIPE-THREADING TOOLS

(See Cutting & Threading Tools, Pipe)

PIPE, UNDERGROUND STEAM

(See Conduit, Underground, Steam)

PIPE, WOOD

Atlantic Creosoting Co, 17 Battery Pl, New York, N. Y.
Limbert, Geo B, & Co, 570 Fulton St, Chicago, Ill.
National Tank & Pipe Co, Portland, Ore.
Pacific Tank & Pipe Co, Oakland, Calif.

PIPE, WROUGHT-IRON

Byers, A M, Co, Pittsburgh, Pa.
Adv page 62
Cohoes Rolling Mills, Cohoes, N. Y.
Crane Co, 836 S Michigan Ave, Chicago, Ill.
Adv page 123
Limbert, Geo B, & Co, 570 Fulton St, Chicago, Ill.
Shaw, Benjamin F, Co, 509 E 2nd St, Wilmington, Del.
Adv page 35
South Chester Tube Co, Front & Thurlow Sts, Chester, Pa.

PIPE-BENDING MACHINES

American Pipe Bending Machine Co, 37 Pearl St, Boston, Mass.
Atlas Pipe Bender Corp, 141 E 25th St, New York, N. Y.
Blackhawk Mfg Co, Milwaukee, Wis.
General Electric Co, Schenectady, N. Y.
Adv pages 32, 33
Keckley, O C, Co, 400 W Madison St, Chicago, Ill.
Tal's Prestal Bender, Inc, Milwaukee, Wis.
Watson-Stillman Co, Roselle, N. J.
Adv page 226

PIPE-THREADING MACHINES

(See Cutting & Threading Machines)

PIPING SYSTEMS, FABRICATED, WELDED

Alco Products Div, 36 Church St, New York, N. Y.
Adv pages 56, 155
American Rolling Mill Co, 700 Curtis St, Middletown, Ohio
California Steel Products Co, Barrett & A Sts, Richmond, Calif.
Crane Co, 836 S Michigan Ave, Chicago, Ill.
Adv page 123
Grinnell Co, Inc, 277 W Exchange St, Providence, R. I.
Adv page 156
Kellogg, M W, Jersey City, N. J.
Adv page 161
Limbert, Geo, B, & Co, 570 Fulton St, Chicago, Ill.
Midwest Piping & Supply Co, 1450 S 2nd St, St Louis, Mo.
Adv page 43
National Valve & Mfg Co, 3102 Liberty Ave, Pittsburgh, Pa.
Adv page 200
Pittsburgh Piping & Equipment Co, 12 43rd St, Pittsburgh, Pa.
Adv page 179
Power Piping Div, Blaw-Knox Co, Blawnox, Pa.
Adv pages 24, 25
Revere Copper & Brass, Inc, 230 Park Ave, New York, N. Y.
Shaw, Benjamin F, Co, 509 E 2nd St, Wilmington, Del.
Adv page 35
Stearns-Roger Mfg Co, Denver, Colo.
Treadwell, M H, Co, 140 Cedar St, New York, N. Y.
Walworth Co, Inc, 60 E 42nd St, New York, N. Y.
Adv pages 172, 173

PISTON RINGS

(See Rings, Piston)

PITOT TUBES

(See Tubes, Pitot)

PLANIMETERS

Bristol Co, Waterbury, Conn.
Crosby Steam Gage & Valve Co, 40 Church St, New York.
Trill Indicator Co, 38 E. South St, Corry, Pa.

PLATES, FLOOR

Alan Wood Steel Co, Conshohocken, Pa.
American Abrasive Metals Co, Irvington, N. J.
Carnegie-Illinois Steel Corp, Pittsburgh, Pa.
Central Iron & Steel Co, Harrisburgh, Pa.
Hendrick Mfg Co,Carbondale, Pa.
Klemp, Wm F, Co, 6651 S Melvina Ave, Chicago, Ill.
Adv page 211
Koppers Co, Pittsburgh, Pa.
Pittsburgh Valve & Fittings Corp, Barberton, Ohio
Ryerson, Jos T, & Son, 16th & Rockwell Sts, Chicago, Ill.

PLUGS, TUBE, BOILER, CONDENSER

Hardie Made-Rite Boiler Tube Plug Co, 122 E 90th St, New York, N. Y.

PLUGS, FUSIBLE

American Injector Co, Detroit, Mich.
Crane Co, 836 S Michigan Ave, Chicago, Ill.
Adv page 123
Detroit Lubricator Co, 5900 Trumbull Ave, Detroit, Mich.
General Electric Co, Schenectady, N. Y.
Adv pages 32, 33
Graybar Electric Co, 420 Lexington Ave, New York, N. Y.
Adv pages 214, 234, 243, 261, 265, 282, 284
International Engrg Works, Inc, Framingham, Mass.
Lunkenheimer Co, Box 360, Annex Station, Cincinnati, O.
Adv pages 221, 240, 275, 276, 278, 279, 280
Nathan Mfg Co, 250 Park Ave, New York, N. Y.
Rockwood Sprinkler Co, 54 Harlow St, Worcester, Mass.
Sherman, H B, Mfg Co, Battle Creek, Mich.
Standard Valve Mfg Co, 817-21 Albany St, Boston, Mass.
Swift Lubricator Co, 330 James Bldg, Elmira, N. Y.
Walworth Co, Inc, 60 E 42nd St, New York, N. Y.
Adv pages 172, 173

PNEUMATIC CONVEYORS

(See Conveying Systems, Pneumatic)

PNEUMATIC DRILLS

(See Drills, Pneumatic, Electric, Portable)

PORTABLE CONVEYORS

(See Conveyors, Portable)

POWER-TRANSMISSION GEAR UNITS

(See Gear Units, Power Transmission)

PRECIPITATORS, DUST, ELECTROSTATIC

American Air Filter Co, Louisville, Ky
Research Corp, 405 Lexington Ave, New York, N. Y.
Western Precipitation Co, 1016 W 9th St, Los Angeles, Calif.
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61

PREHEATERS, AIR

Air Preheater Corp, 60 E 42nd St, New York, N. Y.
Adv page 249
Airtherm Mfg Co, 700 S Spring Ave, St Louis, Mo.
American Locomotive Co, 30 Church St, New York, N. Y.
Adv pages 56, 155
Babcock & Wilcox Co, 85 Liberty St, New York, N. Y.
Adv pages 8, 9, 10, 11
Bros, Wm, Boiler & Mfg Co, Nicollet Id, Minneapolis, Minn.
Combustion Engrg Co, Inc, 205 Madison Ave, New York, N. Y.
Adv pages 16, 17
Combustion Equipment Co, 1820 Cherry St, Kansas City, Mo.
Edge Moor Iron Works, Inc, 30 Rockefeller Plaza, New York, N. Y.
Adv page 182
Erie City Iron Works, 1422 East Ave, Erie, Pa.
Fedders Mfg Co, 63 Tonawanda St, Buffalo, N. Y.
Foster Wheeler Corp, 165 Broadway, New York, N. Y.
Adv pages 38, 39
Green Fuel Economizer Co, 627 Main St, Beacon, N. Y.
Heilman Boiler Works, Allentown, Pa.
Keeler, E. Co, Williamsport, Pa.
Adv page 125
Kennedy-Van Saun Mfg & Engrg Corp, 2 Park Ave, New York, N. Y.
Prat-Daniel Corp, 80 S Water St, Port Chester, N. Y.
Adv pages 212, 262
Riley Stoker Corp, 999 Neponset St, Worcester, Mass.
Adv pages 96, 97
Schubert-Christy Corp, 1600 Georgia St, Affton Station, St Louis, Mo.
Sturtevant, B F, Co, 47 Readville St., Hyde Park, Boston, Mass.
Adv pages 40, 41
Surface Combustion Corp, Sieloff St, Toledo, Ohio
Trent, Harold E, Co, 55th & Wyalusing Ave, Philadelphia.
Union Iron Works, Erie, Pa.
Wickes Boiler Co, 515 N Washington Ave, Saginaw, Mich.

PREHEATERS AND STRESS RELIEVERS, ELECTRIC

American Locomotive Co, 30 Church St, New York, N. Y.
Adv pages 56, 155
Hynes Electric Heating Co, West and Clinton Sts, Camden, N. J.
Trent, Harold E, Co, Philadelphia, Pa.
Vulcan Electric Co, 88-90 Holten St, Danvers, Mass.

PRINTING MACHINES, BLUEPRINT, WHITEPRINT

Brown, David C, Co, 17532 Wisconsin, Detroit, Mich.
Bruning, Charles, Co, 102 Reade St, New York, N. Y.
Ozalid Products Div, Johnson City, N. Y.

PROPELLER FANS

(See Fans, Propeller)

PROPORTIONING PUMPS

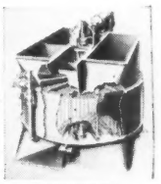
(See Pumps, Proportioning)

PSYCHROMETERS

Bristol Co, Waterbury, Conn.
Brown Instrument Co, 4490 Wayne Ave, Philadelphia, Pa.
Adv pages 51, 240, 254, 258, 266
Foxboro Co, 38 Neponset Ave, Foxboro, Mass.
Friez, Julien P, & Sons, 4 N Central Ave, Baltimore, Md.
Johnson Service Corp, 507 E Michigan St, Milwaukee, Wis.
Palmer Co, 2501-A Norwood Ave, Norwood, Cincinnati, Ohio
Parks-Cramer, Fitchburg, Mass.
Tagliabue, C J, Mfg Co, Park & Nostrand Aves, Brooklyn, N. Y.
Taylor Instrument Cos, Rochester, N. Y.

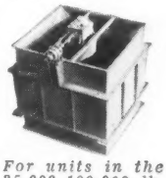
LJUNGSTROM AIR PREHEATER
for higher boiler-plant heat recovery

In high-efficiency steam-plant installations, the Ljungstrom air preheater is today more widely used than any other design. This is not only for the reason that it is capable of higher heat recoveries, but because it is compact, light in weight and most easily adaptable to space restrictions. It operates on the continuous regenerative counterflow principle and the form of its heating surface is such that unusually high rates of heat transfer are obtained in combination with relatively low gas and air resistances. The construction is simple and conducive to low maintenance and repair costs.



Type CGZX Ljungstrom Air Preheater for Vertical Flow of gas and air.

Type CHNX Ljungstrom Air Preheater for Horizontal Flow of gas and air.



For units in the 25,000-100,000 lb. per hr. capacity range. The new Ljungstrom Air Preheater (Rectangular Type) is now available at a reduced first-cost.

Air Preheater Corporation
Executive Offices:
60 East 42nd St., New York, N. Y.
Plant:
Wellesville, New York

PULLEYS, TRANSMISSION

Allis-Chalmers Mfg. Co, Milwaukee, Wis.
Adv pages 6, 7
American Pulley Co, 4200 Wissahickon Ave, Philadelphia, Pa.
Barry Co, Muscatine, Iowa
Bartlett, C O, & Snow Co, Cleveland, Ohio
Caldwell, W E, Co, 280 Brandeis St, Louisville, Ky.
Carey, W W, Co, Lowell, Mass.
Diamond Iron Works Inc, Minneapolis, Minn.
Dick, R & J, Co, Colfax Ave, Passaic, N. J.
Dodge Mfg Corp, Mishawaka, Ind.
Falls Clutch & Machinery Co, Cuyahoga Falls, Ohio
Hill-Acme Co, 6400 Breakwater Ave, Cleveland, Ohio
Ideal Commutator Dresser Co, 1025 Park Ave, Sycamore, Ill.
Jeffrey Mfg Co, 932-99 N 4th St, Columbus, Ohio
Jones, W A, Foundry & Machine Co, 4423 W Roosevelt Rd, Chicago, Ill.
Link-Belt Co, 300 W Pershing Rd, Chicago, Ill.
***Adv page* 3**
McNally Pittsburg Mfg Co, Pittsburg, Kansas
Medart Co, 3548 DeKalb St, St. Louis, Mo.
Reeves Pulley Co, Columbus, Ind.
Rockwood Mfg Co, 1801 English Ave, Indianapolis, Ind.
Schieren, Chas A, Co, 30-39 Ferry St, New York, N. Y.
Smith, Winfield, Inc, 330 West St, Springville, N. Y.
Standard Transmission Equip Co, 416 W 8th St, Los Angeles, Calif.
Stephens-Adamson Mfg Co, 5 Ridgeway Ave, Aurora, Ill.
Adv page 175
Wood's, T B, Sons Co, 1165 5th Ave, Chambersburg, Pa.

PULVERIZED-COAL BURNERS

(See Burners, Pulverized-Coal)

PULVERIZERS, COAL

Babcock & Wilcox Co, 85 Liberty St, New York, N. Y.
Adv pages 8, 9, 10, 11
Bartlett, C O, & Snow Co, Cleveland, Ohio
Combustion Engrg Co, Inc, 205 Madison Ave, New York, N. Y.
Adv pages 16, 17
Erie City Iron Works, 1422 East Ave, Erie, Pa.
Foster Wheeler Corp, 165 Broadway, New York, N. Y.
Adv pages 38, 39
Jeffrey Mfg Co, 932-99 N 4th St, Columbus, Ohio.
Kennedy-Van Saun Mfg & Engrg Corp, 2 Park Ave, New York, N. Y.
McNally Pittsburg Mfg Co, Pittsburg, Kansas
Riley Stoker Corp, 999 Nepenset St, Worcester, Mass.
Adv pages 96, 97
Strong-Scott Mfg Co, N W Terminal, Minneapolis, Minn.
Whiting Corp, 156-57 Lathrop Ave, Harvey, Ill.

PUMPING SYSTEMS, FUEL-OIL

American Marsh Pumps, 60 Capitol Ave, N E, Battle Creek, Mich.
Anthony Co, 47-33 5th St, Long Island City, N. Y.
Blackmer Pump Co, 1904C Century Ave, Grand Rapids, Mich.
Byron Jackson Co, P O Box 2017 Terminal Annex, Los Angeles, Calif.
Columbus Steam Pump Works Co, Columbus, Ohio
Dean Brothers Co, Indianapolis, Ind.
De Laval Steam Turbine Co, Trenton, N. J.
Adv page 58
Eddington Metal Specialty Co, Box K, Eddington, Pa.
Adv pages 244, 252
Engineer Co, 75 West St, New York, N. Y.
Adv page 185
Goulds Pumps, Inc, 301 Fall St, Seneca Falls, N. Y.
Granberg Equipment, Inc, 1308 67th St, Oakland, Calif.
Ingersoll-Rand Co, 11 Broadway, New York, N. Y.
Adv pages 168, 169
Kinney Mfg Co, 3529 Washington St, Boston, Mass.
Kraissl Co, Inc, Hackensack, N. J.
Leahy Mfg Co, E 8th St, Los Angeles, Calif.
McGowan, John H, Div, Leyman Mfg Corp, Cincinnati, O.
Monarch Mfg Works, 2731 E Westmoreland St, Phila, Pa.
National Airoil Burner Co, 1284 E Sedgley Ave, Philadelphia, Pa.
Peerless Pump Div, 301 W Ave 26, Los Angeles, Cal.
Quimby Pump Co, Inc, 347 Thomas St, Newark, N. J.
Roper, Geo D, Corp, Dept PD, Rockford, Ill.
Schutte & Koerting Co, 12th & Thompson Sts, Phila, Pa.
Staples & Pfeiffer, Ltd, 528 Bryant St, San Francisco, Calif.
Tuthill Pump Co, 939 E 95th St, Chicago, Ill.
Viking Pump Co, 404 Decwer St, Cedar Falls, Iowa
Worthington Pump & Machinery Corp, Harrison, N. J.
Adv page 171

PUMP GOVERNORS

(See Governors, Pump)

PUMP VALVES

(See Valves, Pump)

PUMPS, CENTRIFUGAL

Aldrich Pump Co, Allentown, Pa.
Allen-Sherman-Hoff Co, 227 S 15th St, Philadelphia, Pa.
Allis-Chalmers Mfg Co, Milwaukee, Wis.
Adv pages 6, 7
American Marsh Pumps, 60 Capitol Ave N E, Battle Creek, Mich.
American Well Works, 100 N Broadway, Aurora, Ill.
Aurora Pump Co, 615 Loucks St, Aurora, Ill.
Barrett, Haentjens & Co, Hazleton, Pa.
Beach-Russ Co, 50 Church St, New York, N. Y.
Buffalo Pumps, Inc, 488 Broadway, Buffalo, N. Y.
Adv page 199
Byron Jackson Co, P O Box 2017 Terminal Annex, Los Angeles, Calif.
Chicago Pump Co, 2336 Wolfram St, Chicago, Ill.
Coffin, J S, Jr, Co, Englewood, N. J.
Adv page 162
Columbus Steam Pump Works Co, Columbus, Ohio
Cook, A D, Inc, Lawrenceburg, Ind.
Davidson, M T, Co, 154 Nassau St, New York, N. Y.
Dayton-Dowd Co, Quincy, Ill.
Dean Brothers Co, Indianapolis, Ind.
Dean Hill Pump Co, Anderson, Ind.
De Laval Steam Turbine Co, Trenton, N. J.
Adv page 58
Deming Co, 500 Broadway, Salem, Ohio
Duriron Co, Inc, Dayton, Ohio
Economy Pumps, Inc, Hamilton, O.
Fairbanks, Morse & Co, 600 S Michigan Ave, Chicago, Ill.
Foster Pump Works, Inc, 50 Washington St, Brooklyn, N. Y.
Foster Wheeler Corp, 165 Broadway, New York, N. Y.
Adv pages 38, 39
Frederick Iron & Steel Co, Frederick, Md.
Gardner-Denver Co, 100 Gardner Drive, Quincy, Ill.
Goulds Pumps, Inc, 301 Fall St, Seneca Falls, N. Y.
Goyne Steam Pump Co, Ashland, Pa.
Hills-McCanna Co, 3025 N Western Ave, Chicago, Ill.
Ingersoll-Rand Co, 11 Broadway, New York, N. Y.
Adv pages 168, 169
Kimball Krogh Pump Corp, 301 West Ave 26, Los Angeles, Calif.
Kraissl Co, Hackensack, N. J.
Lawrence Pump & Engine Co, Lawrence, Mass.
Lewis, Chas S, & Co, Pine St at 22nd, St Louis, Mo.
Logansport Machine Inc, Logansport, Ind.
McGowan, John H, Div, Leyman Mfg Corp, Cincinnati, Ohio
McNally Pittsburg Mfg Co, Pittsburg, Kansas
Morris Machine Works, 100 E Genesee St, Baldwinsville, N. Y.
Nash Engrg Co, S Norwalk, Ct.
National Lead Co, 111 Broadway, New York, N. Y.
National Steam Pump Co, Upper Sandusky, Ohio
Novo Engine Co, 1 Porter St, Lansing, Mich.
Oliver United Filters, Inc, Oakland, Calif.
Pacific Pump Works, 5715 Bicket St, Huntington Park, Cal.
Peerless Pump Div, 301 W Ave 26, Los Angeles, Cal.
Pennsylvania Pump & Compressor Co, Easton, Pa.
Pomona Pump Co, 206 E Commercial St, Pomona, Cal.
Quimby Pump Co, Inc, 347 Thomas St, Newark, N. J.
Scranton Pump Mfg Co, Scranton, Pa.
Taber Pump Co, 286 Elm St, Buffalo, N. Y.
Union Steam Pump Co, Battle Creek, Mich.
Warren Steam Pump Co, 1234 Bridges Ave, Warren, Mass.
Adv page 250
Weil Pump Co, 215-17 W Superior St, Chicago, Ill.
Weinman Pump Co, Columbus.
Westco Pump Div, 2621 Locust St, St Louis, Mo.
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61
Wilson Snyder Mfg Div, Braddock, Pa.
Worthington Pump & Machinery Corp, Harrison, N. J.
Adv page 171
Yeomans Bros Co, 1446 N Dayton St, Chicago, Ill.
Yuba Mfg Co, San Francisco, Calif.

PUMPS, CONDENSATION-RETURN

Allis-Chalmers Mfg Co, Milwaukee, Wis.
Adv pages 6, 7
Byron Jackson Co, PO Box 2017, Terminal Annex, Los Angeles, Calif.
Columbus Steam Pump Works Co, Columbus, Ohio
Davidson, M T, Co, 154 Nassau St, New York, N. Y.
Dayton-Dowd Co, Quincy, Ill.
De Laval Steam Turbine Co, Trenton, N. J.
Adv page 58
Deming Co, 500 Broadway, Salem, Ohio
Domestic Engine & Pump Co, Shippensburg, Pa.
Dunham, C A, Co, 450 E Ohio St, Chicago, Ill.
Economy Pumps, Inc, Hamilton, Ohio
Fairbanks, Morse & Co, 600 S Michigan Ave, Chicago, Ill.
Hoffman Specialty Co, 1001 York St, Indianapolis, Ind.
Ingersoll-Rand Co, 11 Broadway, New York, N. Y.
Adv pages 172, 173
Johnson Corp, 865 Wood St, Three Rivers, Mich.
Lawrence Pump & Engine Co, Lawrence, Mass.
Nash Engineering Co, S Norwalk, Conn.
National Steam Pump Co, Upper Sandusky, Ohio
Peerless Pump Div, 301 W Ave 26, Los Angeles, Cal.
Quimby Pump Co, 347 Thomas St, Newark, N. J.
Schaub, Fred H, Engrg Co, 325 W Huron St, Chicago, Ill.
Sterling, Inc, Milwaukee, Wis.
Trane Co, 2012 Cameron Ave, La Crosse, Wis.
Warren Steam Pump Co, 1234 Bridges Ave, Warren, Mass.
Adv page 250
Westco Pump Div, 2621 Locust St, St Louis, Mo.
Yeomans Bros Co, 1446 N Dayton St, Chicago, Ill.

PUMPS, DEEPWELL

American Marsh Pumps, 60 Capitol Ave, N E, Battle Creek, Mich.
American Well Works, 100 N Broadway, Aurora, Ill.
Aurora Pump Co, 615 Loucks St, Aurora, Ill.
Byron Jackson Co, P O Box 2017 Terminal Annex, Los Angeles, Calif.
Columbus Steam Pump Works Co, Columbus, Ohio
Cook, A D, Inc, Lawrenceburg, Ind.
Davidson, M T, Co, 154 Nassau St, New York, N. Y.
Dayton Pump & Mfg Co, Dayton, Ohio
Deming Co, 500 Broadway, Salem, Ohio
Fairbanks, Morse & Co, 600 S Michigan Ave, Chicago, Ill.
Adv page 170
Goulds Pumps, Inc, 301 Fall St, Seneca Falls, N. Y.
Jarecki Mfg Co, Erie, Pa.
Kimball-Krogh Pump Co, 326 West Ave 26, Los Angeles, Calif.
Layne & Bowler, Inc, Memphis, Tenn.
McGowan, John H, Div, Leyman Mfg Corp, Cincinnati, Ohio
Morris Machine Works, Baldwinsville, N. Y.
Pacific Pump Works, 5715 Bicket St, Huntington Park, Calif.
Peerless Pump Division, 301 West Ave 26, Los Angeles, Calif.
Pomona Pump Co, 206 E Commercial St, Pomona, Calif.
Adv page 251
Roper, Geo D, Corp, Dept P D, Blackhawk Park Ave, Rockford, Ill.
Westco Pump Div, 2621 Locust St, St Louis, Mo.
Worthington Pump & Machinery Corp, Harrison, N. J.
Adv page 171

WARREN
Reciprocating and Centrifugal
PUMPS

WARREN STEAM PUMP CO., INC.
WARREN, MASSACHUSETTS
Sales representative in principal cities

POMONA INDUSTRIAL PUMPS

POMONA PUMP CO., 120 Broadway, New York City. Plants at 4301 So. Spring Ave., St. Louis, Mo., and 206 Commercial St., Pomona, California.

CLOSE COUPLED TURBINE PUMPS

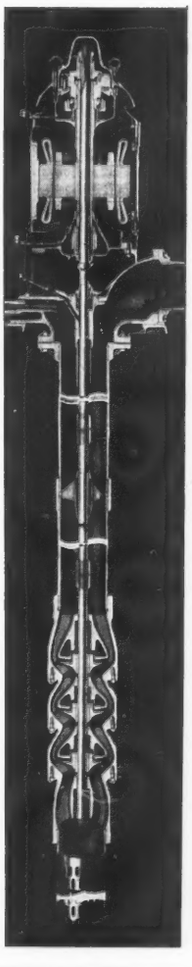
Adaptable for condenser pumping, booster pumps, transfer pumps, circulation pumps, agitation pumps, vat and sump pumps, vacuum lift pressure pumps, vaco-process sinking pumps, caisson dewatering pumps, dredge transfer pumps, air conditioning pumps, wash water pumps for washing filters, water works and sewage treatment pumps, coal cleaning plant pumps, fire protection pumps, etc.

Open drive shaft construction (cold rolled, Monel, stainless, chrome plated, Herculoy, Yoloy, and special analysis steels); cutless rubber, Duprene or special bearings; self-lubricated by the fluid being pumped; semi-open impellers, adjustable capacity; bowls of Pomoloy iron, alloy iron, brass, the alloy bronzes or other special materials.

Sizes from 4 to 24 in.; from single stage to multi-staging; from 1½ hp. to 1000 hp.; capacities from 15 g.p.m. to 10,000 g.p.m.; for lifts against pressures up to 800 p.s.i.; for fluid temperatures to 180° F.

Write for Bulletin No. 29.

NIAGARA PROPELLER AND MIX FLOW PUMPS



Adaptable for condenser circulation and cooling, for transferring large volumes of liquids quickly, for washing and flushing processes (hot or cold), for agitating liquids and semi-liquids in process vats, for dry docks (main and trimming pumps), for pumping out caissons, for check and coffer dams, for storm water drainage, for treated sewage, for handling raw water from lakes and rivers into treating plants, for irrigation, flood control service or storm water drainage.

Shaft, bearing and bowl construction same type as Pomona Close Coupled Turbine Pumps and with varied material specifications to meet specific needs; fabricated column and directed flow type elbow from mild steel, Corten low alloy or other special corrosion resisting plate.

Definitely advantageous for large gallonage low lift operations; compact; no priming requirement. Available in two types—Niagara propeller for relatively low heads and Niagara mix-flow for lifts up to 90 ft. Niagara propeller has same characteristic as ship propeller and operates in bowl assembly with suitable guide vanes. Mix-flow bowl assembly has impeller possessing both axial flow and centrifugal component. Capacities range from 1,000 to 100,000 g.p.m.; for fluid temperatures to 180° F.

Write for Bulletin No. 28.

DEEP WELL TURBINE PUMPS

For primary water supply; for all industrial, municipal, mining and agricultural purposes. Adaptable as boosters; for circulation; cooling, air conditioning, fire protection and other similar purposes.

Open drive shaft construction; cutless rubber bearings revolving in patented precision bronze bearing retainers; water lubricated, assuring delivery of water at the pump head as clean and uncontaminated as at the bottom of the well; semi-open impellers, adjustable for capacity from the top of the pump; fully accessible above ground packing gland; bowls of Pomoloy high tensile strength cast iron; special column pipe and couplings made to precision specifications to assure correct alignment of pump shaft.

Sizes from 4 to 24 in. or larger; from single stage to multi-staging; from 1½ hp. to 1000 hp.; capacities from 15 g.p.m. to 10,000 g.p.m.; for lifts against pressures up to 800 p.s.i.; for temperatures to 180° F.

Write for Bulletin No. 26.

PUMPS, OIL

Allis-Chalmers Mfg Co, Milwaukee, Wis.
Adv pages 6, 7
Blackmer Pump Co, 1904C Century Ave, Grand Rapids, Mich.
Bowser, S F, & Co, 1302 E CreightonAve, FortWayne, Ind.
Byron Jackson Co, PO Box 2017, Terminal Annex, Los Angeles, Calif.
Columbus Steam Pump Works Co, Columbus, Ohio
Dayton-Dowd Co, Quincy, Ill.
De Laval Steam Turbine Co, Trenton, N. J.
Adv page 58
Deming Co, 500 Broadway, Salem, Ohio
Fairbanks, Morse & Co, 600 S Michigan Ave, Chicago, Ill.
Ingersoll-Rand Co, 11 Broadway, New York, N. Y.
Adv pages 168, 169
Kinney Mfg Co, 3529 Washington St, Boston, Mass.
Kraissl Co, Hackensack, N. J.
Lunkenheimer Co, P O Box 360, Annex Station, Cincinnati, Ohio
Adv pages 221, 240, 275, 276, 278, 279, 280
Manzel Bros, Co, 326 Babock St, Buffalo, N. Y.
Milton Roy Pump Co, 1305 E Mermaid Ave, Chestnut Hill, Philadelphia, Pa.
National Transit Pump & Machine Co, Oil City, Pa.
Pacific Pump Works, 5715 Bicket St, Huntington Park, Cal.
Pomona Pump Co, 206 E Commercial St, Pomona, Cal.
Adv page 251
Quimby Pump Co, 347 Thomas St, Newark, N. J.
Roots-Connersville Blower Corp, Connersville, Ind.
Tuthill Pump Co, 939 E 95th St, Chicago, Ill.
Vickers, Inc, Detroit, Mich.
Viking Pump Co, 404 Decwer St, Cedar Falls, Iowa
Warren Steam Pump Co, 1234 Bridges Ave, Warren, Mass.
Adv page 250
Wilson-Snyder Mfg Div, Oil Well Supply Co, Braddock, Pa.

PUMPS, PROPORTIONING

Bird-Archer Co, 90 W St, New York, N. Y.
Adv pages 225, 238, 282, 283
Bowser, S F, & Co, 1302 E Creighton Ave, Fort Wayne, Ind.
Graver Tank & Mfg Co, 4816-10 Tod Ave, E Chicago, Ind.
Haering, D W, & Co, 205 W Wacker Drive, Chicago, Ill.
Hills-McCanna Co, 3025 N Western Ave, Chicago, Ill.
Madden, P E, & Co, 352 W Walton St, Chicago, Ill.
Manzel Bros Co, 326 Babcock St, Buffalo, N. Y.
Milton Roy Pump Co, 1305 E Mermaid Ave, Chestnut Hill, Philadelphia, Pa.
Proportioneers, Inc, 7 Codding St, Providence, R. I.

PUMPS, RECIPROCATING

Aldrich Pump Co, Allentown, Pa.
American Marsh Pumps, 60 Capitol, Battle Creek, Mich.
Baldwin-Southwark Div, Baldwin Locomotive Works, Paschall PO, Phila., Pa.
Columbus Steam Pump Works Co, Columbus, Ohio
Cook, A D, Inc, Lawrenceburg, Ind.
Davidson, M T, Co, 154 Nassau St, New York, N. Y.
Dean Brothers Co, Indianapolis, Ind.
Deming Co, 500 Broadway, Salem, Ohio
Dudgeon, Richard, Inc, 24 Columbia St, New York, N. Y.
Fairbanks, Morse & Co, 600 S Michigan Ave, Chicago, Ill.
Foster Pump Works, 50 Washington St, Brooklyn, N. Y.
Gardner-Denver Co, 100 Gardner Drive, Quincy, Ill.
Gaso Pump & Burner Mfg, Co, Tulsa, Okla.
Goulds Pumps, Inc, 301 Falls St, Seneca Falls, N. Y.
Ingersoll-Rand Co, 11 Broadway, New York, N. Y.
Adv pages 168, 169
McGowan, John H, Div, Leyman Mfg Corp, Cincinnati, Ohio
Milton, Roy Pump Co, 1305 E Mermaid Ave, Chestnut Hill, Phila., Pa.
National Steam Pump Co, Upper Sandusky, Ohio
National Transit Pump & Mach Co, Oil City, Pa.
Pacific Pump Wks, 5715 Bicket St, Huntington Park, Calif.
Robertson, John, Co, 133 Water St, Brooklyn, N. Y.
Roper, Geo D, Corp, Dept PD, Blackhawk Park Ave, Rockford, Ill.
Scranton Pump Mfg Co, Scranton, Pa.
Union Steam Pump Co, Battle Creek, Mich.
Wagener Steam Pump Co, Canton, Ohio
Warren Steam Pump Co, 1234 Bridges Ave, Warren, Mass.
Adv page 250
Watson-Stillman Co, Roselle, N. J.
Adv page 226
Wilson Snyder Mfg Div, Braddock, Pa.
Worthington Pump & Machinery Corp, Harrison, N. J.
Adv page 171

PUMPS, ROTARY

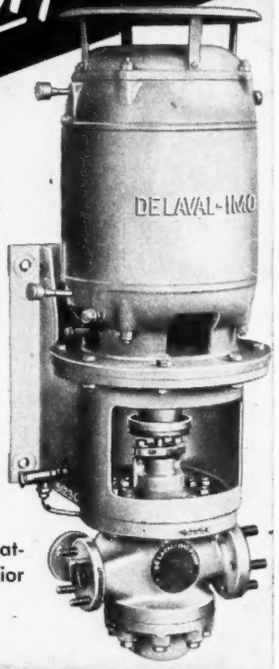
Beach-Russ Co, 50 Church St, New York, N. Y.
Blackmer Pump Co, 1904C Century Ave, Grand Rapids, Mich.
Bowser, S F, & Co, 1302 E Creighton Ave, Fort Wayne, Ind.
De Laval Steam Turbine Co, Trenton, N. J.
Adv page 58
Deming Co, 500 Broadway, Salem, Ohio
Eddington Metal Specialty Co, Box K, Eddington, Pa.
Adv pages 244, 252
Fairbanks, Morse & Co, 600 S Michigan Ave, Chicago, Ill.
Foster Pump Works, 50 Washington St, Brooklyn, N. Y.
Goulds Pumps, Inc, 301 Falls St, Seneca Falls, N. Y.
Granberg Equipment Inc, 1308 67th St, Oakland, Calif.
Ingersoll-Rand Co, 11 Broadway, New York, N. Y.
Adv pages 168, 169
Kimball-Krogh Pump Co, 301 W Ave 26, Los Angeles, Cal.
Kinney Mfg Co, 3529 Washington St, Boston, Mass.
Kraissl Co, Hackensack, N. J.
Morrison Bros Co, Dubuque, Ia.
Nash Engrg Co, S Norwalk, Conn.
National Transit Pump & Mach Co, Oil City, Pa.
Northern Pump Co, Minneapolis, Minn.
Oilgear Co, 1421 W Bruce St, Milwaukee, Wis.
Peerless Pump Div, 301 W 26 Ave, Los Angeles, Calif.
Quimby Pump Co, Inc, 347 Thomas St, Newark, N. J.
Roots-Connersville Blower Corp, Connersville, Ind.
Roper, Geo D, Corp, Dept PD, Blackhawk Park Ave, Rockford, Ill.
Schutte & Koerting Co, 12th & Thompson Sts, Phila, Pa.
Taber Pump Co, 286 Elm St, Buffalo, N. Y.
Tuthill Pump Co, 939 E 95th St, Chicago, Ill.
Vickers Inc, Detroit, Mich.
Viking Pump Co, 404 Decwer St, Cedar Falls, Iowa
Westco Pump Div, 2621 Locust St, St Louis, Mo.
Worthington Pump & Machinery Co, Harrison, N. J.
Adv page 171

PUMPS, SUMP

Allis-Chalmers Mfg Co, Milwaukee, Wis.
Adv pages 6, 7
American Marsh Pumps, 60 Capitol Ave, Battle Creek, Mich.
Aurora Pump Co, 615 Loucks St, Aurora, Ill.
Buffalo Pumps, Inc, 488 Broadway, Buffalo, N. Y.
Adv page 199
Byron Jackson Co, P O Box 2017 Terminal Annex, Los Angeles, Calif.
Chicago Pneumatic Tool Co, 6-8 E 44th St, New York, N. Y.
Chicago Pump Co, 2336 Wolfram St, Chicago, Ill.

IMO

gives a STEADY pressure



IMO I MOVE OIL

The discharge from a De Laval - **IMO** rotary displacement oil pump is smooth and free of pulsation. Where the pump serves fuel oil burners, this is conducive to a steady flame and more efficient combustion. The unit shown, which is to supply burners in marine boiler furnaces, is designed for vertical mounting on a bulkhead. The IMO pump has neither valves nor gears, and no reciprocating or unbalanced parts. The interior is easily accessible.

Ask for Publication I-100

IMO PUMP DIVISION
of the De Laval Steam Turbine Company, Trenton, N. J.

EDCO ROTARY PUMPS

VANE TYPE — PATENTED CONSTRUCTION

At high or low speeds, whether creating a 28" vacuum or developing extremely high pressures, the vanes of EDCO Pumps maintain effective spanning position without springs or centrifugal action.

Fuel transfer pumps, coolant pumps and motor driven assemblies. Furnished in capacities from 2 GPH up in any required corrosion-resisting material. Operate silently at all speeds. Minimum maintenance required. Used for fuel oils and other fluids of any specific gravity. Write for complete data (Bulletin No. 936)

EDDINGTON METAL SPECIALTY CO.

P. O. Box K Eddington, Pa.

Columbus Steam Pump Works Co, Columbus, Ohio
Davidson, M T, Co, 154 Nassau St, New York, N. Y.
Dayton Pump & Mfg Co, Dayton, Ohio
Dean Brothers Co, Indianapolis, Ind.
Dean Hill Pump Co, Anderson, Ind.
De Laval Steam Turbine Co, Trenton, N. J.
Adv page 58
Deming Co, 500 Broadway, Salem, Ohio
Domestic Engine & Pump Co, Shippensburg, Pa.
Economy Pumps, Inc, Hamilton, O.
Fairbanks, Morse & Co, 600 S Michigan Ave, Chicago, Ill.
Frederick Iron & Steel Co, Frederick, Md.
Goulds Pumps, Inc, 301 Fall St, Seneca Falls, N. Y.
Ingersoll-Rand Co, 11 Broadway, New York, N. Y.
Adv pages 168, 169
Kraissl Co, Hackensack, N. J.
Lawrence Pump & Engine Co, Lawrence, Mass.
McGowan, John H, Div, Leyman Mfg Corp, Cincinnati, Ohio
Nash Engrg Co, S Norwalk, Conn.
Peerless Pump Div, 301 West Ave 26, Los Angeles, Calif.
Pomona Pump Co, 206 E Commercial St, Pomona, Cal.
Adv page 251
Quimby Pump Co, Inc, 347 Thomas St, Newark, N. J.
Roper, Geo D, Corp, Dept PD, Blackhawk Park Ave, Rockford, Ill.
Union Steam Pump Co, Battle Creek, Mich.
Westco Pump Div, 2621 Locust St, St Louis, Mo.
Worthington Pump & Machinery Corp, Harrison, N. J.
Adv page 171
Yeomans Bros, Co, 1446 N Dayton St, Chicago, Ill.

PUMPS, VACUUM

Allis-Chalmers Mfg Co, Milwaukee, Wis.
Adv pages 6, 7
American Brake Shoe & Foundry, Kellogg Div, Rochester, N. Y.
American Marsh Pumps, 60 Capitol Ave, Battle Creek, Mich.
Barrett, Haentjens & Co, Hazleton, Pa.
Beach-Russ Co, 50 Church St, New York, N. Y.
Bury Compressor Co, Erie, Pa.
Chicago Pneumatic Tool Co, 6-8 E 44th St, New York, N. Y.
Chicago Pump Co, 2336 Wolfram St, Chicago, Ill.
Clark Bros Co, Olean, N. Y.
Columbus Steam Pump Works Co, Columbus, Ohio
Croll-Reynolds Engrg Co, 17 John St, New York, N. Y.
Adv pages 222, 239
Davidson, M T, Co, 154 Nassau St, New York, N. Y.
Dean Brothers Co, Indianapolis, Ind.
Devine, J P, Mfg Co, Mt Vernon, Ill.
Dunham, C A, Co, 450 E Ohio St, Chicago, Ill.
Economy Pumps Inc, Hamilton, Ohio
Foster Pump Works, Inc, 50 Washington St, Brooklyn, N. Y.
Foster Wheeler Corp, 165 Broadway, New York, N. Y.
Adv pages 38, 39
Fuller Co, 111 Bridge St, Catasauqua, Pa.
Adv pages 213, 253
Gardner-Denver Co, 100 Gardner Drive, Quincy, Ill.
Gaso Pump & Burner Mfg Co, Tulsa, Okla.
Goyne Steam Pump Co, Ashland, Pa.
Hoffman Specialty Co, 1001 York St, Indianapolis, Ind.
Ingersoll-Rand Co, 11 Broadway, New York, N. Y.
Adv pages 168, 169
Kinney Mfg Co, 3529 Washington St, Boston, Mass.
Kraissl Co, Hackensack, N. J.
Lammert & Mann Co, 215-21 N Wood St, Chicago, Ill.
McGowan, John H, Div, Leyman Mfg Corp, Cincinnati, Ohio
Nash Engrg Co, S Norwalk, Conn.
National Steam Pump Co, Upper Sandusky, Ohio
Oliver United Filters, Inc, Oakland, Calif.
Pennsylvania Pump & Compressor Co, Easton, Pa.
Pomona Pump Co, 206 E Commercial St, Pomona, Cal.
Adv page 251
Roots-Connersville Blower Corp, Connersville, Ind.
Schutte & Koerting Co, 12th & Thompson Sts, Phila, Pa.
Sterling Inc, 3713 N Holton St, Milwaukee, Wis.
Stokes, F J, Machine Co, Olney P O, Philadelphia, Pa.
Sullivan Machinery Co, Michigan City, Ind.
Tuthill Pump Co, 939 E 95th St, Chicago, Ill.
Union Steam Pump Co, Battle Creek, Mich.
Wagener Steam Pump Co, Canton, Ohio.
Warren Steam Pump Co, 1234 Bridges Ave, Warren, Mass.
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61
Wheeler, C H, Mfg Co, Lehigh & Sedgley Aves, Phila, Pa.
Whittington, W P, & Co, Indianapolis, Ind.
Worthington Pump & Machinery Corp, Harrison, N. J.
Adv page 171
Yeomans Bros Co, 1446 N Dayton St, Chicago, Ill.

PURGERS, REFRIGERANT GAS

Armstrong Machine Works, 812 Maple St, Three Rivers, Mich.
Adv pages 236, 270
York Ice Machinery Corp, York, Pa.

PURIFIERS, GAS

American Solvent Recovery Corp, Columbus, Ohio
Centrifix Corp, Dept P, 3029 Prospect Ave, Cleveland, O.
Hagan Corp, Hagan Bldg, Pittsburgh, Pa.
Adv pages 30, 31
Koppers Co, Pittsburgh, Pa.

PURIFIERS, OIL, ADSORPTIVE, CHEMICAL

Hilliard Corp, 4 W 4th St, Elmira, N. Y.
Honan-Crane Corp, Lebanon, Ind.
Nugent, Wm, Co, 402 N Hermitage Ave, Chicago, Ill.
Youngstown-Miller Co, Sandusky, Ohio

PURIFIERS, OIL, CENTRIFUGAL

Buckeye Laboratories, Inc, 2890 E 83rd St, Cleveland, Ohio
De Laval Separator Co, 165 Broadway, New York, N. Y.
Adv page 178
Hagan Corp, Hagan Bldg, Pittsburgh, Pa.
Adv pages 30, 31
Sharples Corp, Phila, Pa.
Skinner Purifiers Inc, 1500 Trombly Ave, Detroit, Mich.

PURIFIERS, STEAM

Cochrane Corp, 3106 N 17th St, Philadelphia, Pa.
Adv pages 154, 233, 240, 261, 269
Hagan Corp, 300 Ross St, Pittsburgh, Pa.
Adv pages 30, 31
Infilco, Inc, 325 W 25th Pl, Chicago, Ill.
Adv page 119
Moorehead Mfg Co, 4895 Grand River Ave, Detroit, Mich.

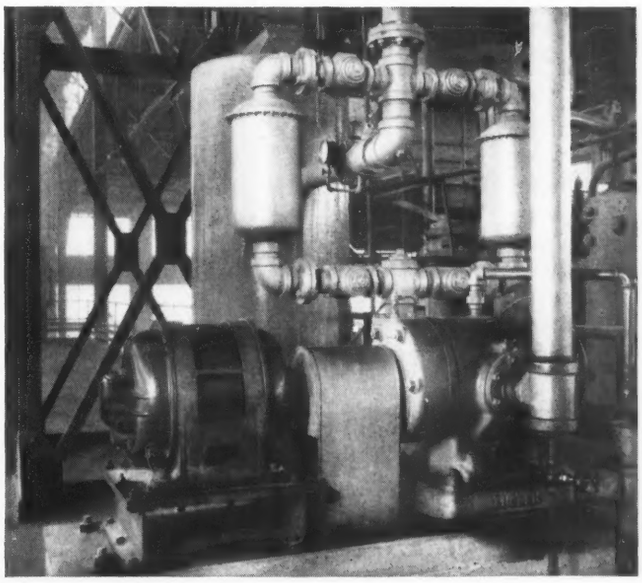
PYROMETERS

Bacharach Industrial Inst Co, 1936 Fifth St, Pittsburgh, Pa.
Adv page 289
Bailey Meter Co, 1036 Ivanhoe Rd, Cleveland, Ohio
Adv pages 14, 15
Bristol Co, Waterbury, Conn.
Brown Instrument Co, 4490 Wayne Ave, Philadelphia, Pa
Adv pages 51, 240, 254, 258, 266
Burrell Technical Supply Co, 1936 Fifth St, Pitsburgh, Pa.
Eimer & Amend, 635 Greenwich St, New York, N. Y.
Englehard, Charles, Inc, 234 N J RR Ave, Newark, N. J.

FULLER ROTARY VACUUM PUMPS

for

HIGH VOLUMETRIC EFFICIENCIES AT HIGH VACUUMS



Single-stage Vacuum Pump, capacity 319 c.f.m. at 28½-in. vacuum.

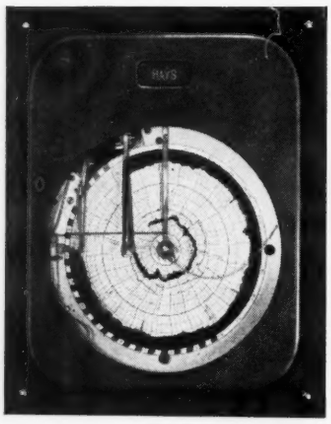
FULLER Rotary Vacuum Pumps, single and two-stage, are available in a full range of capacities to 2000 c.f.m. displacement, and are furnished for vacuums to 29.90-in., (referred to 30-in. barometer).

FULLER Rotaries have many advantages which set them apart from other types. The remarkably small size of these machines and the complete absence of vibration and pulsations adapt them for installation where other types might be objectionable. Continuous rotary motion, few and totally enclosed working parts, direct drive at motor speeds, elimination of valves, reciprocating parts and complicated mechanism keep maintenance costs at a minimum.

Write for Bulletin C-5, illustrating and describing these machines.

C-78

FULLER COMPANY
CATASAUQUA, PENNSYLVANIA
Chicago: 1144 Marquette Bldg.
San Francisco: 421 Chancery Bldg.



STOP FUEL WASTE with a HAYS COMBUSTION METER

HAYS COMBUSTION METERS give you the *facts* about the firing efficiency in your boilers. They point an unerring finger at waste by giving you the exact data on CO_2, drafts and flue gas temperatures. For a surprisingly small investment they give you a "yardstick" on combustion efficiency that will quickly pay for itself in fuel savings.

Let us send you the new, complete and easy to understand booklet on CO_2 measurements. It is for small plants as well as large. It will show the way to real savings in your own plant. Write today.

The HAYS CORPORATION
COMBUSTION INSTRUMENTS AND CONTROL
MICHIGAN CITY, INDIANA, U.S.A.

Foxboro Co, 38 Neponset Ave, Foxboro, Mass.
Leeds & Northrup Co, 4970 Stenton Ave, Philadelphia, Pa.
Adv page 2nd cover
Pyrometer Instrument Co, 103-A Lafayette St, New York, N. Y.
Roller-Smith Co, 1766 W Market St, Bethlehem, Pa.
Adv page 206
Tagliabue, C J, Mfg Co, Park & Nostrand, Brooklyn, N. Y.
Taylor Instrument Cos, Rochester, N. Y.
Wheelco Instruments Co, 863 W Harison St, Chicago, Ill.
Adv pages 203, 216, 254, 258

RADIATOR VALVES
(See Valves, Radiator)

RADIATORS, ENGINE-COOLING
Fedders Mfg Co, 63 Tonawanda St, Buffalo, N. Y.
G & O Mfg Co, New Haven, Conn.
Palmers Mfg Corp, Phoenix, Ariz.
Rome Turney Radiator Co, 200 Lynch St, Rome, N. Y.
Sturtevant, B F, Co, 47 Readville St, Boston, Mass.
Adv pages 40, 41
Weber Engine Co, 12th & Winchester Sts, Kansas City, Mo.
Young Radiator Co, Racine, Wis.

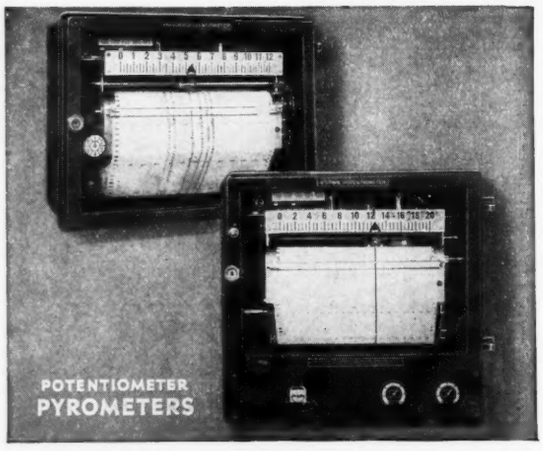
REACTORS, ELECTRIC, CAPACITIVE AND INDUCTIVE
Allis-Chalmers Mfg Co, Milwaukee, Wis.
Adv pages 6, 7
Cornell-Dubilier Electric Corp, 1000 Hamilton, S Plainfield, N. J.
General Electric Co, Schenectady, N. Y.
Adv pages 32, 33
Graybar Electric Co, 420 Lexington Ave, New York, N. Y.
Adv pages 214, 234, 243, 261, 265 282, 284
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61

RECORDERS, CO_2
Brown Instrument Co, 4490 Wayne Ave, Philadelphia, Pa.
Adv pages 51, 240, 254, 258, 256
Defender Automatic Regulator Co, St Louis, Mo.
Englehard, Charles, Inc, 234 N J RR Ave, Newark, N. J.
Hays Corp, 905 Eighth St, Michigan City, Ind.
Adv pages 202, 216, 227, 254
Leeds & Northrup Co, 4970 Stenton Ave, Philadelphia, Pa.
Adv page 2nd cover
Permutit Co, Dept A, 330 W 42nd St, New York, N. Y.
Adv pages 152, 159
Republic Flow Meters Co, 2222 Diversey Pkwy, Chicago, Ill.
Adv pages 215, 221, 241, 280
Uehling Instrument Co, 479 Getty Ave, Paterson, N. J.

RECORDERS, CONDUCTIVITY
Ess Instrument Co, Fort Lee, N. J.
Leeds & Northrup Co, 4970 Stenton Ave, Philadelphia, Pa.
Adv page 2nd cover

RECORDERS, DISSOLVED—OXYGEN
Cambridge Instrument Co, 70 E 45th St, New York, N. Y.
Leeds & Northrup Co, 4970 Stenton Ave, Philadelphia, Pa.
Adv page 2nd cover

RECORDERS, DRAFT
Bristol Co, Waterbury, Conn.
Defender Automatic Regulator Co, St Louis, Mo.
Foxboro Co, 38 Neponset Ave, Foxboro, Mass.
Hays Corp, 905 Eighth St, Michigan City, Ind.
Adv pages 202, 216, 227, 254
Republic Flow Meters Co, 2222 Diversey Pkwy, Chicago, Ill.
Adv pages 215, 221, 241, 280



For Controlling, Recording and Indicating Temperatures from —150° F to +3200° F.

An extremely accurate and dependable instrument, designed and built for industrial service. Operating on the Potentiometer Principle, the instrument can be located practically any distance from the point of temperature measurement (thermocouple location) without affecting its accuracy or dependability.

Charts and scales for a wide variety of ranges are available, from a minimum temperature span of 300°F. to a maximum span of 3000° F. Corresponding Centigrade scales and charts are also available.

Pyrometer accessories, such as thermocouples and extension lead wire, furnished with instruments to meet the individual requirements of each job.

Write for catalog D. THE BROWN INSTRUMENT COMPANY, *a division of Minneapolis-Honeywell Regulator Co.*, 4490 Wayne Avenue, Philadelphia, Pa.

BROWN PYROMETERS
To Measure and Control is to Economize

These BULLETINS tell you
How to Select
THE RIGHT THERMOMETER
for your Process

Wheelco has published five new Bulletins, which illustrate and describe various types of Thermometers and explain their function in relation to their intended application.

You will find a wealth of information in these Bulletins on Indicating Thermometers, Indicating Therm-otrols (Indicating, "Electronic Principle" Thermometer Controllers), Recording Thermometers and Recording Therm-otrols (Recording, "Electronic Principle" Thermometer Controllers), all of which are available in ranges from —100°F. to +1000°F., or —70°C. to +550°C. Also illustrated and described are Thermometer Bulbs, Bulb Sockets, Capillary, Capillary Armor, Charts, Chart Ranges, Scale Ranges, etc. Explanation of how the Flame-otrol (combustion safeguard), Purging Timers, Program Control and Proportioning Control can be integrally incorporated in the various Thermometers is given.

Write for any one, or all of these Bulletins without obligation

Wheelco Instruments Co.
863 W. Harrison Street - - - - - - - - - - - Chicago, Illinois
Originator of "Electronic Principle" Temperature Controls.

Look for the noun in the product listing, for example:
"Rings, Piston"
not
"Piston Rings"

RECORDERS, HUMIDITY

Bristol Co, Waterbury, Conn.
Foxboro Co, 38 Neponset Ave, Foxboro, Mass.
Friez, Julien P, Div, 4 N Central Ave, Baltimore, Md.
Leeds & Northrup Co, 4970 Stenton Ave, Philadelphia, Pa.
Adv page 2nd cover
Mason-Neilan Regulator Co, 1186 Adams St, Boston, Mass.
Minneapolis-Honeywell Regulator Co, 2747 Fourth Ave S, Minneapolis, Minn.
Powers Regulator Co, 2771-2 Greenview Ave, Chicago, Ill.
Tagliabue, C J, Mfg Co, Park & Nostrand Aves, Brooklyn, N. Y.
Taylor Instrument Cos, 95 Ames St, Rochester, N. Y.

RECORDERS, HYDROGEN

Cambridge Instrument Co, 70 E 45th St, New York, N. Y.

RECORDERS, LIQUID-LEVEL

Autocall Co, Shelby, Ohio
Bailey Meter Co, 1036 Ivanhoe Rd, Cleveland, Ohio
Adv pages 14, 15
Builders-Providence Inc, 7 Codding St, Providence, R. I.
Bristol Co, Waterbury, Conn.
Cochrane Corp, 3106 N 17th St, Philadelphia, Pa.
Adv pages 154, 233, 240, 261, 269
Crosby Steam Gage & Valve Co, 40 Church St, New York, N. Y.
Defender Automatic Regulator Co, St Louis, Mo.
Esterline-Angus Co, Box 596, Indianapolis, Ind.
Foxboro Co, 38 Neponset Ave, Foxboro, Mass.
Leeds & Northrup Co, 4970 Stenton Ave, Phila., Pa.
Adv page 2nd cover
Mason-Neilan Regulator Co, 1186 Adams St, Boston, Mass.
Republic Flow Meters Co, 2222 Diversey Pkwy, Chicago, Ill.
Adv pages 215, 221, 241, 280
Tagliabue, C J, Mfg Co, Park & Nostrand Ave, Brooklyn, N. Y.
Taylor Instrument Co's, 95 Ames St, Rochester, N. Y.

RECORDERS, OXYGEN

Bailey Meter Co, 1036 Ivanhoe Rd, Cleveland, Ohio
Adv pages 14, 15
Cambridge Instrument Co, 70 E 45th St, New York, N. Y.

RECORDERS, PRESSURE, VACUUM

Bailey Meter Co, 1036 Ivanhoe Rd, Cleveland, Ohio
Adv pages 14, 15
Bristol Co, Waterbury, Conn.
Crosby Steam Gage & Valve Co, 40 Church St, New York, N. Y.
Defender Automatic Regulator Co, St Louis, Mo.
Esterline-Angus Co, Box 596, Indianapolis, Ind.
Foxboro Co, 38 Neponset Ave, Foxboro, Mass.
Hays Corp, 905 8th St, Michigan City, Ind.
Adv pages 202, 216, 227, 254
Leeds & Northrup Co, 4970 Stenton Ave, Philadelphia, Pa.
Adv page 2nd cover
Manning, Maxwell & Moore, Bridgeport, Conn.
Marsh, J P, & Co, 2049 Southport Ave, Chicago, Ill.
Mason-Neilan Regulator Co, 1186 Adams St, Boston, Mass.
Minneapolis-Honeywell Regulator Co, 2747 Fourth Ave S, Minneapolis, Minn.
Republic Flow Meters Co, 2222 Diversey Pkwy, Chicago, Ill.
Adv pages 215, 221, 241, 280
Tagliabue, C J, Mfg Co, Park & Nostrand Ave, Brooklyn, N. Y.
Taylor Instrument Co's, 95 Ames St, Rochester, N. Y.

RECORDERS, TEMPERATURE

Bailey Meter Co, 1036 Ivanhoe Rd, Cleveland, Ohio
Bristol Co, Waterbury, Conn.
Cochrane Corp, 3106 N 17th St, Philadelphia, Pa.
Adv pages 154, 233, 240, 261, 269
Defender Automatic Regulator Co, St Louis, Mo.
Foxboro Co, 38 Neponset Ave, Foxboro, Mass.
Friez, Julien P, Div, 4 N Central Ave, Baltimore, Md.
Hays Corp, 905 Eighth St, Michigan City, Ind.
Adv pages 202, 216, 227, 254
Leeds & Northrup Co, 4970 Stenton Ave, Philadelphia, Pa.
Adv page 2nd cover
Manning, Maxwell & Moore, Bridgeport, Conn.
Marsh, J P, & Co, 2049 Southport Ave, Chicago, Ill.
Mason-Neilan Regulator Co, 1186 Adams St, Boston, Mass.
Minneapolis-Honeywell Regulator Co, 2747 Fourth Ave S, Minneapolis, Minn.
Palmer Co, 2501-A Norwood Ave, Cincinnati, Ohio
Powers Regulator Co, 2771-2 Greenview Ave, Chicago, Ill.
Republic Flow Meters Co, 2222 Diversey Pkwy, Chicago, Ill.
Adv pages 215, 221, 241, 280
Tagliabue, C J, Mfg Co, Park & Nostrand Ave, Brooklyn, N. Y.
Taylor Instrument Co's, 95 Ames St, Rochester, N. Y.
Wheelco Instruments Co, 863 W Harrison St, Chicago, Ill.
Adv pages 203, 216, 254, 258

RECTIFIERS, ELECTRIC

Allis-Chalmers Mfg Co, Milwaukee, Wis.
Adv pages 6, 7
General Electric Co, Schenectady, N. Y.
Adv pages 32, 33
Graybar Electric Co, 420 Lexington Ave, New York, N. Y.
Adv pages 214, 234, 243, 261, 265, 282, 284
Hanson-Van Winkle-Munning Co, Matawan, N. J.
Schauer Machine Co, Cincinnati, Ohio
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61

REDUCERS, SPEED

(See Gear Units, Power Transmission)

REFRACTORIES

Acme Brick Co, Fort Worth, Tex.
American Arch Co, 63 E 42nd St, New York, N. Y.
Armor-Clad Co, 39 Hyatt Ave, Newark, N. J.
Adv page 255
Babcock & Wilcox Co, 85 Liberty St, New York, N. Y.
Adv pages 8, 9, 10, 11
Bernitz Furnace Appliance Co, 89 Broad St, Boston, Mass.
Botfield Refractories Co, 776-82 S Swanson St, Phila, Pa.
Adv page 255
Brickseal Refractory Co, 1031 Clinton St, Hoboken, N. J.
Adv page 164
Brooklyn Firebrick Works, 88 Van Dyke St, Brooklyn, N. Y.
Carborundum Co, Dept P, Perth Amboy, N. J.
Carolina Refractories Co, Hartsville, S. C.
Chicago Fire Brick Co, 1463 Elston Ave, Chicago, Ill.
Denver Fire Clay Co, 2301 Blake St, Denver, Colo.
Detrick, M H, Co, 140 S Dearborn St, Chicago, Ill.
DeWolf Furnace Corp, 77 South Ave, Rochester, N. Y.
Drake Non-Clinkering Furnace Block Co, Beekman St, New York, N. Y.
Electro Refractories & Alloys Corp, Andrews Bldg, Buffalo, N. Y.
Faulkner, J A, Refractories Co, W Federal St, Youngstown, O.
Furnace Economy Co, 201 N Wells St, Chicago, Ill.
General Refractories Co, 1600 Real Estate Trust Bldg, Philadelphia, Pa.

Do you want 50% to 300% More Furnace Wall LIFE?

- Armor-Clad refractory coating positively prevents adhesions, slag, spalling. SEALS all pores in walls, as well as the joints. Furnace may be fired immediately after Armor-Clad application—no delay. Low cost of installation. There's an Armor-Clad coating for all types of furnaces, Boiler or metallurgical. Send for circular "Keeping America's Furnaces on the Firing Line."

ARMOR - CLAD COMPANY
REFRACTORY ENGINEERS
39 Hyatt Ave. Newark, N. J.

BOTFIELD REFRACTORIES
—for low cost furnace maintenance

Adamant Fire Brick Cement
—a plastic ready-mixed cement that air sets and maintains bond throughout entire temperature range. Has a P.C.E. of 3000° F. plus. Tests show Adamant has bonding strength of 800 lbs. per sq. in. at room temperature. 1270 lbs. per sq. in. at 2600° F.

Adachrome Plastic Super Cement
A longer lasting plastic chrome cement for use where high temperatures, slag action, abrasion, erosion or other destructive elements are encountered. Shipped ready for use.

Adachrome—Cote
A superior refractory surfacing material that provides a brushed or sprayed coating to furnace walls which protects them from the attack of destructive elements.

There's an Adaproduct for every refractory need
BOTFIELD REFRACTORIES COMPANY
World's Largest Makers of High Temperature Cements
784 S. SWANSON STREET PHILADELPHIA, PENNSYLVANIA

DURA-STIX
FIREBRICK CEMENT
THE SUPER QUALITY REFRACTORY.
— OVER TWENTY YEARS —
UNIVERSALLY USED AS THE BONDING MEDIUM FOR REFRACTORY MASONRY
Send for Circular D-518
KEYSTONE REFRACTORIES COMPANY
120 LIBERTY ST. NEW YORK, N. Y.

PLIBRICO *Jointless* FIREBRICK

LASTS longer and gives more economical service than laid-up fire brick. Eliminates weak joints and loose brick; patented Flexo-Anchors prevent bulging. Saves fuel.

For patching, complete walls, full relining. Local Plibrico distributor will gladly quote on your repairs. Complete installation and boiler setting service in over 100 cities.

Catalog free.

PLIBRICO JOINTLESS FIREBRICK CO.
1818 KINGSBURY ST. CHICAGO, ILLINOIS

Look for the noun in the product listing, for example:
"Rings, Piston"
not
"Piston Rings"

Green, A P, Fire Brick Co, 1020 Breckenridge, Mexico, Mo.
Harbison-Walker Refractories Co, 1800 Farmers Bank Bldg, Pittsburgh, Pa.
Johns-Manville, 22 E 40th St, New York, N. Y.
Adv pages 44, 45
Keystone Refractories Co, 120 Liberty St, New York, N. Y.
Adv page 255
Laclede-Christy Clay Products Co, 411 N 7th, St Louis, Mo.
McLeod & Henry Co, Inc, 31 Monroe St, Troy, N. Y.
Mexico Refractories Co, Mexico, Mo.
North American Refractories Co, Cleveland, Ohio
Norton Co, Worcester, Mass.
Pilbrico Jointless Firebrick Co, 1818 Kingsbury, Chicago, Ill.
Adv pages 205, 206, 255, 282
Pyro Clay Products Co, Oak Hill, Ohio
Quigley Co, 56 W 45th St, New York, N. Y.
Ramtite Co, 2563 W 18th St, Chicago, Ill.
Refractory & Insulation Corp, 381 4th Ave, New York, N. Y.
Reintjes, Geo P, Co, 2517 Jefferson St, Kansas City, Mo.
Seaboard Refractories Co, P O Box 151, Perth Amboy, N. J.
Smith, Sanford C, Refractories, 1715 Niagara St, Buffalo, N. Y.
U. S. Stoneware Co, 62 E 42 St, New York, N. Y.
Vitrefax Corp, 5050 Pacific Bldg, Los Angeles, Cal.

REFRIGERATING SYSTEMS

Airtemp Div, Chrysler Corp, Dayton, Ohio
Baker Ice Machine Co, Inc, Omaha, Neb.
Brunner Mfg Co, 1821 Broad St, Utica, N. Y.
Carrier Corp, Syracuse, N. Y.
Croll-Reynolds Engrg Co, 17 John St, New York, N. Y.
Adv pages 222, 239
Curtis Pneumatic Machinery Co, 1934 Kien Ave, St Louis, Mo.
Adv page 28
Frick Co, Inc, 325 Broadway, Waynesboro, Pa.
Frigidaire Commercial & Air Cond Div, Dayton, Ohio
General Machinery Co, Riverside Ave, Spokane, Wash.
General Refrigeration Div, Yates-American Machine Co, Beloit, Wis.
Howe Ice Machine Co, 2821 Montrose Ave, Chicago, Ill.
Ingersoll-Rand Co, 11 Broadway, New York, N. Y.
Adv pages 172, 173
Richmond Engrg Co, 7th & Hospital Sts, Richmond, Va.
Ross Heater & Mfg Co, Inc, 1409 West Ave, Buffalo, N. Y.
Stearns-Roger Mfg Co, Denver, Colo.
Vilter Mfg Co, 2217 S 1st St, Milwaukee, Wis.
Vogt, Henry, Machine Co, 1000 W Ormsby St, Louisville, Ky.
Adv page 46
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61
Wheeler, C H, Mfg Co, Lehigh & Sedgley Aves, Phila, Pa.
Worthington Pump & Machinery Corp, Harrison, N. J.
Adv page 171
York Ice Machy Corp, York, Pa.

REFRIGERATION ACCUMULATORS

(See Accumulators, Refrigeration)

REGULATING VALVES

(See Valves, Regulating)

REGULATORS, DAMPER

American Coal Burner Co, 155 E Superior St, Chicago, Ill.
Adv page 264
Anemostat Corp of America, 10 E 39th St, New York, N. Y.
Askania Regulator Co, S Michigan Ave, Chicago, Ill.
Atlas Valve Co, 289 South St, Newark, N. J.
Adv page 281
Atwood & Morrill Co, Salem, Mass.
Bailey Meter Co, 1036 Ivanhoe Rd, Cleveland, Ohio
Adv pages 14, 15
Barber Colman Co, Rockford, Ill.
Bristol Co, Waterbury, Conn.
Brown Instrument Co, 4490 Wayne Ave, Philadelphia, Pa.
Adv pages 51, 240, 254, 258, 266
Cash, A W, Co, 402 N Eldorado St, Decatur, Ill.
Davis Regulator Co, 3540 S Washtenaw Ave, Chicago, Ill.
Defender Automatic Regulator Co, St. Louis, Mo.
Dunham, C A, Co, 405 E Ohio St, Chicago, Ill.
Engineer Co, 75 West St, New York, N. Y.
Adv page 185
Field Mfg Co, 2328 Nelson Ave, Chicago, Ill.
Foster Engrg Co, 109 Monroe St, Newark, N. J.
Adv pages 230, 257, 259, 276
Friez, Julian P, & Sons, 4 N Central Ave, Baltimore, Md.
General Regulator Corp, 165 Broadway, New York, N. Y.
Adv page 127
Hagan Corp, Hagan Bldg, Pittsburgh, Pa.
Adv pages 30, 31
Hays Corp, 905 E 8th St, Michigan City, Ind.
Adv pages 202, 216, 227, 254
Hotstream Heater Co, 8007 Grand Ave, Cleveland, Ohio
Illinois Engrg Co, Racine Ave, & 21st St, Chicago, Ill.
Johnson Service Co, 509 E Michigan St, Milwaukee, Wis.
Kieley & Mueller, Inc, 2015-2033 43rd St, N Bergen, N. J.
Kitts Steam Specialty Co, 270 W Second St, Oswego, N. Y.
Leahy Mfg Co, E 8th St, Los Angeles, Calif.
Leeds & Northrup Co, 4970 Stenton Ave, Phila, Pa.
Adv page 2nd cover
Mason-Neilan Regulator Co, 1186 Adams St, Boston, Mass.
Mercoid Corp, 4229 Belmont Ave, Chicago, Ill.
Minneapolis-Honeywell Regulator Co, 2747 4th Ave S, Minneapolis, Minn.
Penn Electric Switch Co, Goshen, Ind.
Power Turbo-Blower Co, 30 Vesey St, New York, N. Y.
Reading, Pratt & Cady Div, Reading, Pa.
Adv pages 176, 177
Republic Flow Meters Co, 2222 Diversey Pkwy, Chicago, Ill.
Adv pages 215, 221, 241, 280
Ruggles-Klingemann Mfg Co, Salem, Mass.
Schade Valve Mfg Co, 2527 N Bodine St, Philadelphia, Pa.
Trane Co, 2012 Cameron Ave, La Crosse, Wis.
Triplex Heating Specialty Co, Peru, Ind.
Waterloo Register Co, Waterloo, Iowa
Watts Regulator Co, Lawrence, Mass.

REGULATORS, ELECTRIC-CURRENT-DEMAND

General Electric Co, Schenectady, N. Y.
Adv pages 32, 33
Graybar Electric Co, 420 Lexington Ave, New York, N. Y.
Adv pages 214, 234, 243, 261, 265, 282, 284
Johnston & Jennings Co, 878 Addison Rd, Cleveland, Ohio
Adv page 47
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61

REGULATORS, FEEDWATER

Askania Regulator Co, S Michigan Ave, Chicago, Ill.
Atlas Valve Co, 289 South St, Newark, N. J.
Adv page 281
Bailey Meter Co, 1036 Ivanhoe Rd, Cleveland, Ohio
Adv pages 14, 15
Brown Instrument Co, 4490 Wayne Ave, Philadelphia, Pa.
Adv pages 51, 240, 254, 258, 266
Campbell, J A, Co, Long Beach, Calif.
Chaplin-Fulton Mfg Co, 28-40 Penn Ave, Pittsburgh, Pa.
Defender Automatic Regulator Co, St. Louis, Mo.
Eclipse Fuel Engrg Co, 707 S Main St, Rockford, Ill.
Fischer & Porter Co, 60 County Line Rd, Hatboro, Pa.
Foster Engineering Co, 109 Monroe St, Newark, N. J.
Hagan Corp, Hagan Bldg, Pittsburgh, Pa.
Adv pages 30, 31
Henszey Co, Dept D-14, Watertown, Wis.
Johnson Corp, 865 Wood St, Three Rivers, Mich.
Kieley & Mueller, Inc, 2015-2033 43rd St, N Bergen, N. J.
Kitts Steam Specialty Co, 270 W 2nd St, Oswego, N. Y.
McAlear Mfg. Co, 1908 S Western Ave, Chicago, Ill.
McDonnell & Miller, Room 1305, Wrigley Bldg, Chicago, Ill.
Mason-Neilan Regulator Co, 1186 Adams St, Boston, Mass.
Mercon Regulator Co, 2357 N 29th St, Milwaukee, Wis.
Minneapolis-Honeywell Regulator Co, 2747 4th Ave S, Minneapolis, Minn.
Northern Equipment Co, 1221 Grove Drive, Erie, Pa.
Adv page 119
Plouff Co, 1150 Columbus Ave, Boston, Mass.
Republic Flow Meters Co, 2222 Diversey Pkwy, Chicago, Ill.
Adv pages 215, 221, 241, 280
Schaub, Fred H, Engrg Co, 325 W Huron St, Chicago, Ill.
Squires, C E, Co, E 40th St & Kelley Ave, Cleveland, O.
Adv page 287
Stets Co, 1440 Broadway, New York, N. Y.
Swartwout Co, 18501 Euclid Ave, Cleveland, Ohio
Adv page 312
Watts Regulator Co, Lawrence, Mass.
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61
Wheelco Instrument Co, 863 W Harrison St, Chicago, Ill.
Adv pages 203, 216, 254, 258
Williams Gauge Co, 1938 Pennsylvania Ave, N S, Pittsburgh, Pa.
Adv page 274
Wright-Austin Co, Detroit, Mich.

REGULATORS, FREQUENCY, ELECTRIC-GENERATOR

Allis-Chalmers Mfg Co, Milwaukee, Wis.
Adv pages 6, 7
Burlington Instrument Corp, 316 Valley St, Burlington, Iowa
Graybar Electric Co, 420 Lexington Ave, New York, N. Y.
Adv pages 214, 234, 243, 261, 265, 282, 284
Leeds & Northrup Co, 4970 Stenton Ave, Philadelphia, Pa.
Adv page 2nd cover
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61

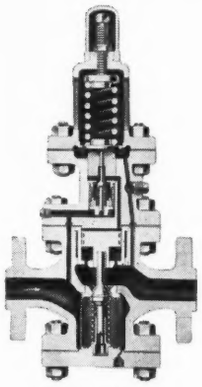
REGULATORS, LIQUID-LEVEL

Askania Regulator Co, S Michigan Ave, Chicago, Ill.
Atlas Valve Co, 289 South St, Newark, N. J.
Adv page 281
Atwood & Morrill Co, Salem, Mass.
Automatic Control Co, 1005 University Ave, St Paul, Minn.
Bailey Meter Co, 1036 Ivanhoe Rd, Cleveland, Ohio
Adv pages 14, 15
Bristol Co, Waterbury, Conn.
Brooke Engineering Co, Inc, 4517 Wayne Ave, Philadelphia, Pa.
Brown Instrument Co, 4490 Wayne Ave, Philadelphia, Pa.
Adv page 51
Builders-Providence Inc, 7 Codding St, Providence, R. I.
Adv page 242
Cash, A W, Co, 402 N Eldorado St, Decatur, Ill.
Chaplin-Fulton Mfg Co, 28-40 Penn Ave, Pittsburgh, Pa.
Cochrane Corp, 3106 N 17 St, Philadelphia, Pa.
Adv page 154
Davis Regulator Co, 2540 S Washtenaw Ave, Chicago, Ill.
Defender Automatic Regulator Co, St Louis, Mo.
Fisher Governor Co, 203 S 1st Ave, Marshalltown, Iowa
Foster Engrg Co, 109 Monroe Ave, Newark, N. J.
Adv pages 230, 257, 259, 276
Foxboro Co, 38 Neponset Ave, Foxboro, Mass.
General Controls Co, 810 Allen Ave, Glendale, Calif.
General Regulator Corp, 165 Broadway, New York, N. Y.
Adv page 127
Golden-Anderson Valve Specialty Co, 1315 Fulton Bldg, Pittsburgh, Pa.
Adv page 140
Griscom-Russell Co, 285 Madison Ave, New York, N. Y.
Hagan Corp, Hagan Bldg, Pittsburgh, Pa.
Adv pages 30, 31
Johnson Corp, 865 Wood St, Three Rivers, Mich.
Johnson Service Co, 509 E Michigan St, Milwaukee, Wis.
Keckley, O C, Co, 400 W Madison St, Chicago, Ill.
Kieley & Mueller, Inc, 2015-2033 43rd St, N Bergen, N. J.
Klipfel Mfg Co, 2651 W Harrison St, Chicago, Ill.
McAlear Mfg Co, Chicago, Ill.
McDonnell & Miller, Wrigley Bldg, Chicago, Ill.
Mason-Neilan Regulator Co, 1186 Adams St, Boston, Mass.
Mercoid Corp, 4229 Belmont Ave, Chicago, Ill.
Mercon Regulator Co, 2357 N 29th St, Milwaukee, Wis.
Natural Gas Equipment, Inc, 539 Petroleum Bldg, Los Angeles, Calif.
Northern Equipment Co, 1221 Grove Drive, Erie, Pa.
Adv page 119
Penn Electric Switch Co, Goshen, Ind.
Photoswitch Inc, 21 Chestnut St, Cambridge, Mass.
Republic Flow Meters Co, 2222 Diversey Pkwy, Chicago, Ill.
Adv pages 215, 221, 241, 280
Ruggles-Klingemann Mfg Co, Salem, Mass.
Sarco Co, 475 5th Ave, New York, N. Y.
Schade Valve Mfg Co. 2527 N Bodine St, Philadelphia, Pa.
Schaub, Fred H, Engrg Co, 325 W Huron St, Chicago, Ill.
Spence Engrg Co, Inc, 61 Grant St, Walden, N. Y.
Stets Co, 1440 Broadway, New York, N. Y.
Strong, Carlisle & Hammond Co, 1392 W 3rd St, Cleveland, Ohio
Adv page 285
Swartwout Co, 18511 Euclid Ave, Cleveland, Ohio
Adv page 312
Tagliabue, C J, Mfg Co, Park & Nostrand Aves, Brooklyn, N. Y.
Taylor Instrument Cos, Rochester, N. Y.
Watts Regulator Co, Lawrence, Mass.
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61
Wheelco Instrument Co, 863 W Harrison St, Chicago, Ill.
Adv pages 203, 216, 254, 258
Wright-Austin Co., Detroit, Mich.

REGULATORS, PRESSURE

Air Reduction Sales Company, 60 E 42nd St, New York, New York
Alco Valve Co, 2628 Big Bend Blvd, St Louis, Mo.
American District Steam Co, 70 Bryant St, N Tonawanda, N. Y.
Adv page 160
American Meter Co, Inc, 60 E 42nd St, New York, N. Y.
Askania Regulator Co, S Michigan Ave, Chicago, Ill.
Atlas Valve Co, 289 South St, Newark, N. Y.
Adv page 281

FOSTER PRESSURE REDUCING REGULATORS



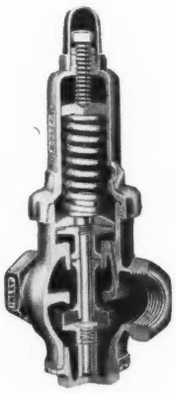
Type 37-G2S

For Steam—Type 37-G2

Built for pressures up to 1500 lbs. and 900° F. total temperature, the improved Foster Type 37-G2 Pressure Reducing Regulator assures accurate regulation despite widest variations of initial pressure. Single-seated for dead-end service, both pilot and main valve are protected by internal strainers from pipe line sediment. Streamlining of body distributes and assures free flow of steam, while construction of main valve provides maximum lift to minimize pulsating and wire drawing—affords graduated flow and modulating control. Can be fitted with either a locking cap or with a hand wheel for ready adjustment.

Type	Total Temperature Deg. Fahr.	Initial Pressure	Reduced Pressure	Spring Ranges, Pounds	Sizes, In.	Connections
		Lbs. per Sq. In.				
37-G2C	475	300	3 to 275	½–6 (LP) 3–15 (LP) 5–275†	½– 2 ½– 2	Screwed Flanged
37-G21	475	300	½ to 15	½– 6 3–15	1¼– 4 1¼–12	Screwed Flanged
37-G2S	900	1500	½ to 1200	½–6 (LP) 3–15 (LP) 5–1200†	½– 2 ½–12	Screwed Flanged

† In Intermediate Ranges.



Type 38-U

For Water and Air—Type 38-U

A series of five types of valves for the wide range of services requiring regulation of water and air—in power and process plants, water works, office buildings, hotels, apartment houses, and residences. All are built for total temperatures of 160° F.—all are single-seated for dead-end service—all are automatically balanced so that variations in initial pressure do not affect final pressure. All have renewable main valve discs, and sizes 2½ in. and larger have renewable seat rings.

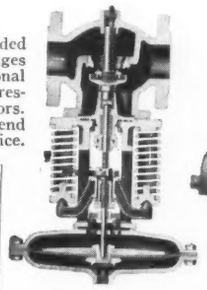
Type	Regulation	Initial Pressure	Reduced Pressure	Spring Ranges, Pounds	Sizes, In.	Connections
		Lbs. per Sq. In.				
38-U	Average	300	10–125 10–100	10–100	½– 2 2½– 8	Screwed Flanged
38-U1	Accurate	300	5–80	5–80† 5–40†	½– 2 2½– 6	Screwed Flanged
38-U2	Accurate particularly on widely varying loads	300	5–200 5–80	5–20 (LP) 15–200 (LP) 5–80†	2½– 6 8–24	Flanged Flanged
38-U3*	Extremely accurate under all service conditions	125	5–80	5–20(LP) 15–80†	2½– 6	Flanged

* Types 38-U3 and 38-U6 are widely used as altitude valves on two-pipe and one-pipe systems, respectively.
† In Intermediate ranges.

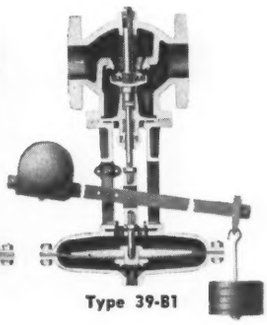
For Steam, Liquids and Gases—Types 37-A and 39-B

Built in six types for the widest range of services, Foster Types 37-A and 39-B Pressure Reducing Regulators assure accurate regulation without constant cleaning. All are available for initial pressures up to 250 lbs. and total temperatures of 475° F. All are so designed that the possibility of sticking and scoring from scale, sediment and dirt is negligible. The double spring-loaded Type 37-A Regulators have definite advantages over the ordinary regulator with the conventional single spring while sensitivity at low reduced pressures is assured by the Type 39-B Regulators. Both classes are made single-seated for dead-end service and double-seated for continuous service.

Type	Service	Regulation	Initial Pressure	Reduced Pressure	Sizes. In.	Connections
			Lbs. per Sq. In.			
37-A1 and 39-B1	Dead-end	Accurate where initial pressures are relatively constant	250	5–125 0–25	½–2 1–6	Screwed Flanged
37-A9 and 39-B9	Dead-end	Accurate where initial pressures are widely variable	250	5–125 0–25	½–2 1–6	Screwed Flanged
37-A2 and 39-B2	Continuous flow	Extremely accurate under all service conditions	250	5–100 0–25	½–2 1–12	Screwed Flanged



Type 37-A1



Type 39-B1

For Steam, Liquids and Gases—Type 39-Q1

Here is one of the latest developments in pressure-reducing regulators—an air-loaded dome design for the accurate regulation of high and low pressure fluids, whether steam, liquids, or gases.

Built for initial pressures up to 2500 lbs. per sq. in. and temperatures up to 1000° F., this valve will handle pressure reductions of a magnitude previously impractical in a single stage.

There are no operating springs in this simple, single-seated regulator. A constant loading is imposed by air, thereby insuring constant regulation. Accuracy is unaffected by spring deflection and hysteresis, and its simplicity by the complicated pilot designs commonly used to overcome these inaccuracies.

Features —

(1) Accurate and sensitive regulation insured by constant air load in dome.

(2) Single seated for dead-end service—and shuts in direction of flow for tight closure.

(3) Simple to set over the widest range of pressures. There are no springs to adjust or change.

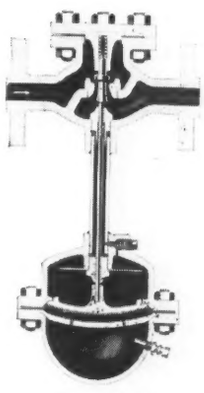
(4) Affords single-stage reductions of extreme magnitude—and operates without hunting or chattering.

(5) *Safe*—the diaphragm is shielded from differential pressure stress; should it fail, the pressure across it equalizes and closes the valve.

(6) Less friction, less maintenance. There are a minimum of moving parts, no large sliding surfaces or side thrusts, and no stuffing boxes to bind or to pack.

(7) All parts are readily accessible and renewable. The thorough-bolted construction of diaphragm chamber simplifies inspection. No special tools are required.

Because of these and other features, the Foster Type 39-Q1 Pressure Reducing Regulator has the widest range of applications—in power and process plants, refineries, paper mills, packing plants, rubber factories, and in marine service—wherever extreme accuracy of regulation is required under rapidly and widely varying loads.



Type 39-Q1
(Type 39-Q2
Double Seated)

A new complete catalog will be sent to executives and engineers engaged in those industries serving national defense if the request is written on their company's letterhead.

FOSTER ENGINEERING COMPANY

106 MONROE STREET ***Manufacturers of a Complete Line of Automatic Valves*** **NEWARK, N. J.**

12-FE-1

Atwood & Morrill Co, Salem, Mass.
Bailey Meter Co, 1036 Ivanhoe Rd, Cleveland, Ohio
Adv pages 14, 15
Bastian-Blessing Co, 4201 Peterson Ave, Chicago, Ill.
Bell & Gossett Co, Chicago, Ill.
Bristol Co, Waterbury, Conn.
Brooke Engineering Co, Inc, 4517 Wayne Ave, Philadelphia, Pa.
Brown Instrument Co, 4490 Wayne Ave, Philadelphia, Pa.
Adv pages 51, 240, 254, 258, 266
Cash, A W, Co, 402 N Eldorado St, Decatur, Ill.
Chaplin-Fulton Mfg Co, 28-40 Penn Ave, Pittsburgh, Pa.
Crane Co, 836 S Michigan Ave, Chicago, Ill.
Adv page 123
Davis Regulator Co, 2540 S Washtenaw Ave, Chicago, Ill.
Defender Automatic Regulator Co, St. Louis, Mo.
Dunham, C A, Co, 450 E Ohio St, Chicago, Ill.
Durametallic Corp, Cobb Ave, Kalamazoo, Mich.
Fisher Governor Co, 203 S 1st Ave, Marshalltown, Iowa
Foster Engrg Co, 109 Monroe St, Newark, N. J.
Adv pages 230, 257, 259, 276
Foxboro Co, 38 Neponset Ave, Foxboro, Mass.
Fulton Sylphon Co, Knoxville, Tenn.
Adv page 258
General Regulator Corp, 165 Broadway, New York, New York.
Adv page 127
Golden-Anderson Valve Specialty Co, 1315 Fulton Bldg, Pittsburgh, Pa.
Adv page 140
Grove Regulator Co, 1190 67th St, Oakland, Calif.
Hagan Corp, Hagan Bldg, Pittsburgh, Pa.
Adv pages 30, 31
Hays Corp, 905 8th St, Michigan City, Ind.
Adv pages 202, 216, 227, 254
Hotstream Heater Co, 8007 Grand Ave, Cleveland, Ohio
Illinois Engrg Co, Racine Ave & 21st St, Chicago, Ill.
Johnson Service Co, 507 E Michigan St, Milwaukee, Wis.
Keckley, O C, Co, 400 W Madison St, Chicago, Ill.
Kieley & Mueller, Inc, 2015-2033 43rd St, N Bergen, N. J.
Klipfel Mfg Co, 2651 W Harrison St, Chicago, Ill.
Leslie Co, Lyndhurst, N. J.
McAlear Mfg Co, Chicago, Ill.
Mason-Neilan Regulator Co, 1186 Adams St, Boston, Mass.
Mercoid Corp, 4229 Belmont Ave, Chicago, Ill.
Mercon Regulator Co, 2357 N 29th St, Milwaukee, Wis.
Minneapolis-Honeywell Regulator Co, 4490 Wayne Ave, Philadelphia, Pa.
Natural Gas Equipment, Inc. 539 Petroleum Bldg, Los Angeles, Calif.
Norgren, C A, Co, Denver, Colo.
Northern Equipment Co, 1221 Grove Drive, Erie, Pa.
Adv page 119
Penn Electric Switch Co, Goshen, Ind.
Plouff Co, 1150 Columbus Ave, Boston, Mass.
Powers Regulator Co, 2771-2 Greenview Ave, Chicago, Ill.
Reading-Pratt & Cady Div, Reading, Pa.
Adv pages 176, 177
Republic Flow Meters Co, 2222 Diversey Pkwy, Chicago, Ill.
Adv pages 215, 221, 241, 280
Ruggles-Klingemann Mfg Co, Salem, Mass.
Schade Valve Mfg Co, 2527 N Bodine St, Philadelphia, Pa.
Shallcross Controls, Inc, 121 N Broadway, Milwaukee, Wis.
Spence Engrg Co, Inc, 61 Grant St, Walden, N. Y.
Squires, C E, Co, E 40th St & Kelley Ave, Cleveland, Ohio
Adv page 287
Staples & Pfeiffer, Ltd, 528 Bryant St, San Francisco, Calif.
Strong, Carlisle & Hammond Co, 1392 W 3rd St, Cleveland, O.
Adv page 285
Swartwout Co, 18511 Euclid Ave, Cleveland, Ohio
Adv page 312
Tagliabue, C J, Mfg Co, Park & Nostrand Aves, Brooklyn, N. Y.
Taylor Instrument Cos, Rochester, N. Y.
Waters Governor Co, 1123 Oliver Bldg, Boston, Mass.
Watts Regulator Co, Lawrence, Mass.
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61
Wheelco Instruments Co, 863 W Harrison St, Chicago, Ill.
Adv pages 203, 216, 254, 258
York Ice Machy Corp, York, Pa.

REGULATORS, SPEED, ELECTRIC-MOTOR

Allen-Bradley Co, Milwaukee, Wis.
Allis-Chalmers Mfg Co, Milwaukee, Wis.
Adv pages 6, 7
Burlington Instrument Corp, 316 Valley St, Burlington, Iowa
Cutler-Hammer Inc, 315 N 12th St, Milwaukee, Wis.
Adv page 107
General Electric Co, Schenectady, N. Y.
Adv pages 32, 33
Graybar Electric Co, 420 Lexington Ave, New York, N. Y.
Adv pages 214, 234, 243, 261, 265, 282, 284
Republic Flow Meters Co, 2222 Diversey Pkwy, Chicago, Ill.
Adv pages 215, 221, 241, 280
Ward Leonard Electric Co, 31 South St, Mt Vernon, N. Y.
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61

REGULATORS, TEMPERATURE

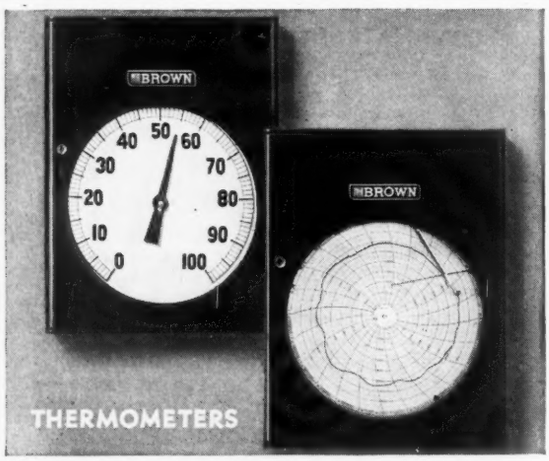
Atlas Valve Co, 289 South St, Newark, N. J.
Adv page 281

Sylphon Controls

● for the automatic regulation of temperatures in water heating, processing, space heating, air conditioning and refrigeration.

FULTON Sylphon FOR TEMPERATURE CONTROL

THE FULTON SLYPHON CO., Knoxville, Tenn.
Representatives in all principal cities



For Controlling, Recording and Indicating Temperatures from —40 to +1200° F.

A pressure type, remote bulb type thermometer, consisting of instrument, bulb and connecting tubing completely assembled as one unit. Can be furnished with connecting tubing lengths up to 200 feet.

Charts and scales for a wide variety of ranges are available, from a minimum temperature span of 75°F to a maximum span of 1200°F. Corresponding Centigrade scales and charts are also available.

Controllers and recorders furnished with a 12" or a 10" diameter chart. Indicators are equipped with a 26" concentric or a 7½" eccentric scale. Three kinds of thermal systems are available: vapor-filled, gas-filled, and mercury-filled.

Bulbs, sockets and connecting tubing can be furnished in various styles and material to meet the requirements of each individual job.

Write for catalog. THE BROWN INSTRUMENT COMPANY, *a division of Minneapolis-Honeywell Regulator Co.*, 4490 Wayne Avenue, Philadelphia, Pa.

BROWN THERMOMETERS AND PRESSURE GAUGES
Accurate Measurement with Simplicity

Only... Wheelco UNIVERSAL Temperature Controllers

can give you:

1. "Electronic Principle" Control, *plus*
2. Extreme accuracy of temperature measurement, *plus*
3. Interchangeability of all component parts, *plus*
4. Interchangeability of scale ranges, *plus*
5. Ready accessibility of all parts for individual checking, *plus*
6. Setting devices which may be mounted and locked within the instrument case as a precaution against sabotage.

Wheelco UNIVERSAL Controllers include Capacitrols, Potentio-trols, Limitrols and Resistance Therm-otrols.

Wheelco UNIVERSAL Controllers have unlimited applications for indicating, measuring and controlling temperatures. For complete information on these instruments write for free bulletin.

This **BULLETIN**

— fully describes and illustrates Wheelco Universal Controllers and other Wheelco Instruments. Write, TODAY, for Bulletin Z6100.

Wheelco Instruments Co.
863 W. HARRISON STREET . . . CHICAGO, ILLINOIS
Originator of "Electronic Principle" Temperature Controls.

Automatic Temperature Control Co, Germantown Ave & Logan St, Philadelphia, Pa.
Bailey Meter Co, 1036 Ivanhoe Rd, Cleveland, Ohio
Adv pages 14, 15
Barber-Colman Co, Rockford, Ill.
Bristol Co, Waterbury, Conn.
Brown Instrument Co, 4490 Wayne Ave, Philadelphia, Pa.
Adv pages 51, 240, 254, 258, 266
Burling Instrument Co, 253 Springfield Ave, Newark, N. J.
Cash, A W, Co, 402 N Eldorado St, Decatur, Ill.
Defender Automatic Regulator Co, St Louis, Mo.
Eastern Engineering Co, 45 Fox St, New Haven, Conn.
Edison, Thomas A, West Orange, N. J.
Engelhard, Charles, Inc, 234 N J RR Ave, Newark, N. J.
Fenwal Inc, 100 Main St, Ashland, Mass.
Foster Engrg Co, 109 Monroe St, Newark, N. J.
Adv pages 230, 257, 259, 276
Foxboro Co, 38 Neponset Ave, Foxboro, Mass.
Friez, Julien P, & Sons, Inc, 4 N Central, Baltimore, Md.
Fulton Sylphon Co, Knoxville, Tenn.
Adv page 258
General Controls Co, 810 Allen Ave, Glendale, Calif.
General Regulator Corp, 165 Broadway, New York, N. Y.
Adv page 127
Hagan Corp, Hagan Bldg, Pittsburgh, Pa.
Adv pages 30, 31
Illinois Engrg Co, Racine Ave & 21st St, Chicago, Ill.
Jefferson Electric Co, Bellwood, Ill.
Johnson Service Co, 509 E Michigan St, Milwaukee, Wis.
Keckley, O C, Co, 400 W Madison St, Chicago, Ill.
Kieley & Mueller, Inc, 2015-2033 43rd St, N Bergen, N. J.
Klipfel Mfg Co, 2651 W Harrison St, Chicago, Ill.
Leeds & Northrup Co, 4970 Stenton Ave, Philadelphia, Pa.
Adv page 2d cover
Leslie Co, Lyndhurst, N. J.
McAlear Mfg Co, Chicago, Ill.
Mason-Neilan Regulator Co, 1186 Adams St, Boston, Mass.
Mercoid Corp, 4229 Belmont Ave, Chicago, Ill.
Minneapolis-Honeywell Regulator Co, 2747 4th Ave S, Minneapolis, Minn.
Penn Electric Switch Co, Goshen, Ind.
Powers Regulator Co, 2771-2 Greenview Ave, Chicago, Ill.
Reading-Pratt & Cady Div, Reading, Pa.
Adv pages 176, 177
Republic Flow Meters Co, 2222 Diversey Pkwy, Chicago, Ill.
Adv pages 215, 221, 241, 280
Ruggles-Klingemann Mfg Co, Salem, Mass.
Sarco Co, 475 5th Ave, New York, N. Y.
Spence Engrg Co Inc, 61 Grant St, Walden, N. Y.
Sterling Inc, Milwaukee, Wis.
Tagliabue, C J, Mfg Co, Park & Nostrand, Brooklyn, N. Y.
Taylor Instrument Cos, Rochester, N. Y.
Vapor Car Heating Co, 80 East Jackson Blvd, Chicago, Ill.
Wheelco Instruments Co, 863 W Harrison St, Chicago, Ill.
Adv pages 203, 216, 254, 258

REGULATORS, VOLTAGE

Allis-Chalmers Mfg Co, Milwaukee, Wis.
Adv pages 6, 7
Burlington Instrument Corp, 316 Valley St, Burlington, Iowa
Electric Machinery Mfg Co, 1331 Tyler St, N E, Minneapolis, Minn.
General Electric Co, Schenectady, N. Y.
Adv pages 32, 33
Ward Leonard Electric Co, 31 South St, Mt Vernon, N. Y.
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61

RELAYS, ELECTRIC

Allen-Bradley Co, Milwaukee, Wis.
Allis-Chalmers Mfg Co, Milwaukee, Wis.
Adv pages 6, 7
Autocall Co, Shelby, Ohio
Automatic Switch Co, 41 E 11 St, New York, N. Y.
Automatic Temperature Control Co, Inc, Germantown Ave & Locust St, Philadelphia, Pa.
Cutler Hammer, Inc, 315 N 12th St, Milwaukee, Wis.
Adv page 107
Edison, Thomas A, West Orange, N. J.
Ess Instrument Co, Fort Lee, N. J.
Esterline-Angus Co, Box 596, Indianapolis, Ind.
Friez, Julian P, & Sons, 4 North Central Ave, Baltimore, Md.
General Controls Co, 810 Allen Ave, Glendale, Calif.
General Electric Co, Schenectady, N. Y.
Adv pages 32, 33
Graybar Electric Co, 420 Lexington Ave, New York, N. Y.
Adv pages 214, 234, 243, 261, 265, 281, 284
Mercoid Corp, 4229 Belmont Ave, Chicago, Ill.
Minneapolis-Honeywell Regulator Co, 2747 4th Ave S, Minneapolis, Minn.
Penn Electric Switch Co, Goshen, Ind.
Roller-Smith Co, 1766 W Market St, Bethlehem, Pa.
Adv page 206
Signal Engrg & Mfg Co, 161 W 14th St, New York, N. Y.
Vapor Car Heating Co, 80 East Jackson Blvd, Chicago, Ill.
Ward Leonard Electric Co, 31 South St, Mt Vernon, N. Y.
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61
Weston Electrical Instrument Corp, 614 Frelinghuysen Ave, Newark, N. J.
Adv pages 202, 267

RELIEF VALVES

(See Valves, Relief)

REPAIR WORK, BOILER

Bigelow Co, 260-22 River St, New Haven, Conn.
Bros, Wm, Boiler & Mfg Co, Nicollet Id, Minneapolis, Minn.
Brownell Co, 301 N Findlay St, Dayton, Ohio
California Steel Prod Co, Barrett & A Sts, Richmond, Calif.
Dover Boiler Works, 90 E Dickinson St, Dover, N. J.
General Machinery Co, Riverside Ave, Spokane, Wash.
Hodge Boiler Works, East Boston, Mass.
Kroeschell Boiler Co, Racine, Wis.
Marshall Heater Co, Dayton, O.
Webster, Howard J, Greene & Hortter Sts, Philadelphia, Pa.

REPAIR WORK, CHIMNEY

American Chimney Co, 147 4th Ave, New York, N. Y.
Boland, John V, Constr Co, 2715 Dalton Ave, St Louis, Mo.
Bros, Wm, Boiler & Mfg Co, Nicollet Id, Minneapolis, Minn.
Continental Chimney Co, 127 N Dearborn St, Chicago, Ill.
Custodis, Alphons, Chimney Const Co, 80 Broad St, New York, N. Y.
Cutshall, J M, & Sons, Brazil, Ind.
Rust Engrg Co, Pittsburgh, Pa.
Stearns-Roger Mfg Co, Denver, Colo.
Weber Chimney Co, 332 S Michigan Ave, Chicago, Ill.

REPAIR WORK, CONDENSER

California Steel Prod Co, Barrett & A Sts, Richmond, Calif.
Condenser Service & Engineering Co, 310 12th St, Hoboken, N. J.
Adv page 181
General Machy Co, Riverside Ave, Spokane, Wash.

REPAIR WORK, ENGINE

Brownell Co, 301 N Findlay St, Dayton, Ohio
Dissinger, C H A, & Bros Co, Inc, Wrightsville, Pa.
Franklin Machine Co, Providence, R. I.
General Machinery Co, Riverside Ave, Spokane, Wash.
Johnson Mfg Co, Fox & Holly Sts, Seattle, Wash.
Murray Iron Works Company, Burlington, Iowa
Adv page 148
Nordberg Mfg Co, 3073 S Chase Ave, Milwaukee, Wis.
Providence Engrg Works Inc, Providence, R. I.
Watertown Engine & Machine Co, Watertown, N. Y.
Weber Engine Co, 12th & Winchester Sts, Kansas City, Mo.
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61

RESURFACING COMPOUNDS

(See Compounds, Concrete, Resurfacing)

RETURN TRAPS

(See Traps, Return)

RHEOSTATS

Allen-Bradley Co, Milwaukee.
Allis-Chalmers Mfg Co, Milwaukee, Wis.
Adv pages 6, 7
Biddle, James G, Co, 1211-13 Arch St, Philadelphia, Pa.
Adv page 138
Clark Controller Co, 1146 E 152nd St, Cleveland, Ohio
Cooley Electric Mfg Corp, 217 S Senhte, Indianapolis, Ind.
Cutler-Hammer, Inc, 315 N 12th St, Milwaukee, Wis.
Adv page 107
General Electric Co, Schenectady, N. Y.
Adv pages 32, 33
Hanson-Van Winkle-Munning Co, Matawan, N. J.
Monitor Controller Co, Lombard & Gay Sts, Baltimore, Md.
Ohmite Mfg Co, 4819 Flournoy St, Chicago, Ill.
Ward Leonard Electric Co, 31 South St, Mt Vernon, N. Y.
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61

RINGS, CHILL

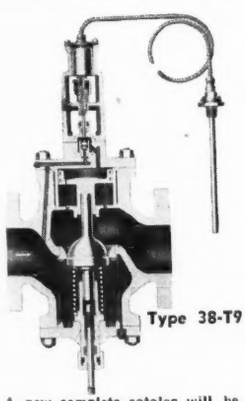
Wedge Protectors, Inc, 9524 Richmond Ave, Cleveland, O.
Adv page 198

RINGS, PISTON

American Hammered Piston Ring Div, Koppers Co, Baltimore, Md.
Barnett Foundry & Machine Co, Woolsey St, Irvington, N. J.
Burd Piston Ring, Rockford, Ill.
Cook, C Lee, Mfg Co, 916 S 8th St, Louisville, Ky.
Double-Seal Ring Corp, 98-02 217th Lane, Queens Village, N. Y.
Holland Piston Ring Co, Holland, Mich.
Koppers Co, Pittsburgh, Pa.
McQuay-Norris Mfg Co, St. Louis, Mo.
Mellor Packing Mfg Co, 332 Ocean Ave, Jersey City, N. J.
Perfect Circle, Hagerstown, Ind.
Sealed Power Corp, Muskegon, Mich.
Wilkening Mfg Co, 2009 S 71st St, Philadelphia, Pa.

RODS, WELDING

Air Reduction Sales Co, 60 E 42nd St, New York, N. Y.
American Brass Co, 25 Broadway, New York, N. Y.
Adv page 121
American Manganese Steel Div, 397 E 14th St, Chicago Heights, Ill.
American Steel & Wire Co, Rockefeller Bldg, Cleveland, Ohio
Chase Brass & Copper Co, Inc, 236 Grand St, Waterbury, Conn.
Driver-Harris Co, Harrison, N. J.
Eutectic Welding Alloys, Inc, 40 Worth St, New York, N. Y.
General Electric Co, Schenectady, N. Y.
Adv pages 32, 33
General Welding & Equipment Co, 268 Northampton St, Boston, Mass.
Harnischfeger Corp, Milwaukee, Wis.
Haynes Stellite Co, Kokomo, Ind.
Hobart Bros Co, Troy, Ohio
Lincoln Electric Co, 12818 Coit Rd, Cleveland, Ohio


Type 38-T9

A new complete catalog will be sent to executives and engineers engaged in those industries serving national defense if the request is written on their company's letterhead.

FOSTER TEMPERATURE REGULATORS

These Foster Temperature Regulators are direct-acting or pilot-operated valves for accurately controlling the temperature of liquids or gases. Both single and double seated for dead-end or continuous-flow service, these regulators include such refinements as an over-travel device provided for the protection of the thermal unit, preventing its destruction when excessive temperatures develop. Complete with 10 ft. of capillary tubing.

Type	Service	Action	Regulation Approx. Deg. Fahr.	Working Pressures Lbs. per Sq. In. Min.	Max.	Ranges of Temp. Adjustment, Deg. Fahr.	Sizes, In.	Connections
37-T4	Dead-end	Direct throttling	±1–3	5	450	(0–110) (40–150) (90–200) (140–250) (190–300)	¼, ⅜, ½	¼, ⅜, ½ Screwed
34-T2	Continuous flow	Direct throttling	±2–4	0	125	(40– 80) (70–110) (100–140) (120–160) (130–170) (140–180) (160–200)	½ to 1½	½ to 1½ Screwed 1 to 1½ Flanged
37-T3	Continuous flow	Direct throttling	±2–5	0	50	(0–100) (50–160) (90–200) (140–250) (190–300)	2 to 8	1 to 3 Screwed 2 to 8 Flanged
34-T	Dead-end	Pilot intermittent	±1	10	200	(0–110) (40–150) (90–200) (140–250) (190–300)	½ to 2	½ to 2 Screwed 1 to 2 Flanged
38-T9	Intermittent and dead-end	Pilot throttling	±1	25	450	(0–110) (40–150) (90–200) (140–250) (190–300)	½ to 12	½ to 4 Screwed 1¼ to 12 Flanged

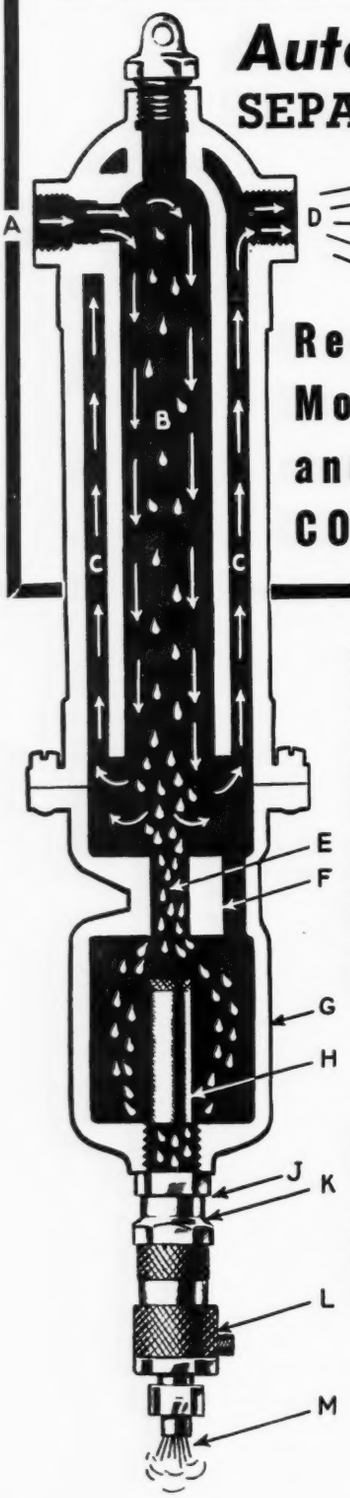
Ranges of temperature adjustment other than those shown will be furnished on request. 12-FE-1

FOSTER ENGINEERING COMPANY 106 MONROE STREET, NEWARK, N. J.

SWENDEMAN

Automatic SEPARATORS for

Removing Moisture and Oil from COMPRESSED AIR



Simple, compact dependable units, available in sizes from ⅛" to 4" inclusive in the following types.

Type "A" — for installations where pressure regulation is not necessary and where air can be shut off while valve and screen are removed for cleaning.

Type "C"—for same service as type "A" but provided with valve equipment between body and eliminator making it possible to clean valve and not interfere with air supply.

Type "D"—an improved model for use where pressure regulation is essential.

OPERATING PRINCIPLE

Air enters at "A", passes into expansion chamber "B", expands and precipitates all oil and moisture into eliminator "G" from which it is immediately expelled through vent "L". The air rises through expansion chamber "C", which, having a greater area than "B", gives the air a second chance to precipitate. Clean air returns to the line at "D".

•

Ask for Bulletin giving detailed specifications.

•

ALSO

Dexter Valve Reseating Equipment.

The LEAVITT MACHINE CO.

ORANGE, MASS.

Linde Air Products Co, 30 E 42nd St, New York, N. Y.
Adv pages 36, 37
McKay Co, York, Pa.
Marquette Mfg Co, 409 Jefferson St, N E, Minneapolis, Minn.
Metal & Thermit Corp, 120 Broadway, New York, N. Y.
Modern Engrg Co, St Louis, Mo.
Mueller Brass Co, 1925A Lapeer Ave, Port Huron, Mich.
National Carbon Co, Carbon Sales Div, Cleveland, Ohio
National Cylinder Gas Co, 205 W Wacker Dr, Chicago, Ill.
Revere Copper & Brass, Inc, 230 Park Ave, New York, N. Y.
Adv pages 20, 21
Scovill Mfg Co, 99 Mill St, Waterbury, Conn.
Adv page 111
Speer Carbon Co, 40 Theresa St, St Mary's, Pa.
Stoody Co, Whittier, Calif.
Weldcraft Equipment Co, 2623 Liberty Ave, Pittsburgh, Pa.
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61
Youngstown Sheet & Tube Co, Youngstown, Ohio
Adv page 189

ROPE, WIRE

American Cable Div, American Chain & Cable Co, Wilkes-Barre, Pa.
American Steel & Wire Co, Rockefeller Bldg, Cleveland, Ohio
Bethlehem Steel Co, Bethlehem, Pa.
Broderick & Bascom Rope Co, St. Louis, Mo.
Hazard Wire Rope Div, American Chain & Cable Co, Wilkes-Barre, Pa.
Jones & Laughlin Steel Corp, Pittsburgh, Pa.
Leschen, A, & Sons Rope Co, 5909 Kennerly, St. Louis, Mo.
Macwhyte Wire Rope Co, Kenosha, Wis.
Roebling's, John A, Sons Co, 640 S Broad St, Trenton, N. J.
Union Wire Rope Corp, Kansas City, Mo.
Wickwire Spencer Steel Co, 500 5th Ave, New York, N. Y.

ROTARY CONVERTERS

(See Converters, Rotary)

RUBBER PACKING

(See Packing, Rubber)

RUST-PREVENTING COMPOUNDS

(See Compounds, Rust-Preventing)

RUST REMOVERS

(See Compounds, Rust-Removing)

SAFETY APPLIANCES

(Goggles, Masks, Belts, Etc.)

Black, Sivalls & Bryson Inc, Kansas City, Kans.
McDonnell & Miller, Wrigley Bldg, Chicago, Ill.
Mine Safety Appliance Co, Pittsburgh, Pa.
Pulmosan Safety Equipment, 176 John St, Brooklyn, N. Y.
Weldcraft Equipment Co, 2623 Liberty Ave, Pittsburgh, Pa.

SAMPLERS, COAL

Sturtevant Mill Co, 103 Clayton St, Boston, Mass.
Adv page 220

SANDBLAST EQUIPMENT

American Foundry Equipment Co, Mishawaka, Ind.
Macleod Co, 2236 Bogen St, Cincinnati, Ohio
Master Metal Spray, 2527 Magnolia St, Oakland, Calif.
Mott Sand Blast Mfg Co, Flourney St, Chicago, Ill.
Pangborn Corp, 90 Pangborn Blvd, Hagerstown, Md.
Ruemelin Mfg Co, Milwaukee, Wis.
Sly, W W, Mfg Co, Cleveland, Ohio
Straight Line Foundry & Machine Corp, 218 S Geddes St, Syracuse, N. Y.
Stoody Co, Whittier, Calif

SCALES, WEIGH

Beaumont Birch Co, 1505 Race St, Philadelphia, Pa.
Buffalo Scale Co, 1200 Niagara St, Buffalo, N. Y.
Builders-Providence Inc, 7 Codding St, Providence, R. I.
Adv page 242
Chatillon, John, & Sons, 85 Cliff St, New York, N. Y.
Detecto Gram Scales Div, 1 Main St, Brooklyn, N. Y.
Exact Weight Scale Co, 944 W 5th Ave, Columbus, Ohio
Fairbanks, Morse & Co, 600 S Michigan Ave, Chicago, Ill.
Gifford-Wood Co, 24 Hill St, Hudson, N. Y.
Merrick Scale Mfg Co, 178 Autumn St, Passaic, N. J.
Richardson Scale Co, 690 Van Houten Ave, Clifton, N. J.
Stock Engrg Co, 9805 Theodore Ave, Cleveland, Ohio
Adv page 164
Streeter-Amet Co, 4101 Ravenswood, Box P, Chicago, Ill.
Syntron Co, 492 Lexington Ave, Homer City, Pa.
Toledo Scale Co, Power Sales Div, Toledo, Ohio

SCREENS, BAR

Chain Belt Co, 1674 W Bruce St, Milwaukee, Wis.
Gifford-Wood Co, 24 Hill St, Hudson, N. Y.
Kennedy-Van Saun Mfg & Engrg Corp, 2 Park Ave, New York, N. Y.
Koppers Co, Pittsburgh, Pa.
Link-Belt Co, 2045 Hunting Park Ave, Philadelphia, Pa.
Adv page 3
McNally Pittsburg Mfg Co Pittsburg, Kansas
Maddox Foundry & Machine Works, Inc, Archer, Fla.
Newark Wire Cloth Co, 355-369 Verona Ave, Newark, N. J.
Robins Conveying Belt Co, Passaic, N. J.
Adv page 188
Savage, W J, Co, Knoxville, Tenn.
Stephens-Adamson Mfg Co, 5 Ridgeway Ave, Aurora, Ill.
Adv page 175

SCREENS, TRAVELING

Andale Co, 1600 Arch St, Philadelphia, Pa.
Chain Belt Co, 1674 W Bruce St, Milwaukee, Wis.
General Machinery Co, Spokane, Wash.
Link-Belt Co, 2045 Hunting Park Ave, Philadelphia, Pa.
Adv page 3
McNally Pittsburg Mfg Co, Pittsburg, Kansas

SEPARATORS, COMPRESSED-AIR

Andale Co, 1600 Arch St, Philadelphia, Pa.
Centrifix Corp, Dept P, 3029 Prospect Ave, Cleveland, Ohio
Cochrane Corp, 3106 N 17th St, Philadelphia, Pa.
Adv pages 154, 233, 240, 261, 269
Crane Co, 836 S Michigan Ave, Chicago, Ill.
Adv page 123
Dri-Steam Products Inc, 559 W 35th St, New York, N. Y.
Hagan Corp, Hagan Bldg, Pittsburgh, Pa.
Adv pages 32, 33, 149
Johnson Corp, 865 Wood St, Three Rivers, Mich.
Keckley, O C, Co, 400 W Madison St, Chicago, Ill.
Leavitt Machine Co, 8 E River St, Orange, Mass.
Adv pages 260, 274
Master Metal Spray Co, 2527 Magnolia St, Oakland, Calif.
Nicholson, W H, & Co, 125 Oregon St, Wilkes-Barre, Pa.
Adv pages 227, 269, 271
Railway & Industrial Engrg Co, Greensburgh, Pa.
Staynew Filter Corp, 25 Leighton Ave, Rochester, N. Y.
Straight Line Foundry & Machine Corp, 218 S Geddes St, Syracuse, N. Y.
Swartwout Co, 18511 Euclid Ave, Cleveland, Ohio
Adv page 312

SEPARATORS, MAGNETIC

Barnard & Leas Mfg Co, Moline, Ill.

Cutler-Hammer Inc, 315 N 12th St, Milwaukee, Wis.
Adv page 107
Dings Magnetic Separator Co, Milwaukee, Wis.
Electric Controller & Mfg Co, Cleveland, Ohio
Ohio Electric Mfg Co, 5938 Maurice Ave, Cleveland, Ohio
Stearns Magnetic Mfg Co, 657 S 28th St, Milwaukee, Wis.
Stearns-Roger Mfg Co, Denver.

SEPARATORS, OIL

Air Maze Corp, 5120 Harvard Ave, Cleveland, Ohio
Black, Sivalls & Bryson, Inc, Oklahoma City, Okla.
Centrifix Corp, Dept P, 3029 Prospect Ave, Cleveland, Ohio
Cochrane Corp, 3106 N 17th St, Philadelphia, Pa.
Adv pages 154, 233, 240, 261, 269
Crane Co, 836 S Michigan Ave, Chicago, Ill.
Adv page 123
Dri-Steam Products Inc, 559 W 35th St, New York, N. Y.
Elliott Co, Jeannette, Pa.
Adv pages 4, 5, 187
Hagan Corp, Hagan Bldg, Pittsburgh, Pa.
Adv pages 30, 31
Illinois Engineering Co, Racine Ave & 21st St, Chicago, Ill.
Keckley, O C, Co, 400 W Madison St, Chicago, Ill.
Kieley & Mueller, 2015-2033 43rd St, N Bergen, N. J.
McAlear Mfg Co, Chicago, Ill.
Marshall Heater Co, Dayton, O.
Nugent, Wm, & Co, 402 N Hermitage Ave, Chicago, Ill.
Plouff Co, 1150 Columbus Ave, Boston, Mass.
Power Plant Specialty Co, 431 S Dearborn St, Chicago, Ill.
Schutte & Koerting Co, 12th & Thompson Sts, Philadelphia, Pa.
Staynew Filter Corp, 25 Leighton Ave, Rochester, N. Y.
Stickle Steam Specialties Co, 2217 Valley Ave, Indianapolis, Ind.
Straight Line Foundry & Machine Corp, 218 S Geddes St, Syracuse, N. Y.
Strong, Carlisle & Hammond Co, 1392 W 3rd St, Cleveland, O.
Adv page 285
Swartwout Co, 18511 Euclid Ave, Cleveland, Ohio
Adv page 312
Webster, Warren & Co, Camden, N. J.
Adv page 272
Wright-Austin Co, Detroit, Mich.

SEPARATORS, STEAM

American District Steam Co, 70 Bryant St, N Tonawanda, N. Y.
Adv page 160
Babcock & Wilcox Co, 85 Liberty St, New York, N. Y.
Adv pages 8, 9, 10, 11
Centrifix Corp, Dept P, 3029 Prospect Ave, Cleveland, Ohio
Cochrane Corp, 3106 N 17th St, Philadelphia, Pa.
Adv pages 154, 233, 240, 261, 269
Crane Co, 836 S Michigan Ave, Chicago, Ill.
Adv page 123
Dri-Steam Products Inc, 559 W 35th St, New York, N. Y.
Elliott Co, Jeannette, Pa.
Adv pages 4, 5, 187
Fisher Governor Co, 203 S 1st Ave, Marshalltown, Iowa
Graver Tank & Mfg Co, 4316-10 Tod Ave, E Chicago, Ind.
Hagan Corp, Hagan Bldg, Pittsburgh, Pa.
Adv pages 30, 31
Illinois Engineering Co, Racine Ave & 21st St, Chicago, Ill.
International Filter Co, 325 W 25th Place, Chicago, Ill.
Johnson Corp, 865 Wood St, Three Rivers, Mich.
Keckley, O C, Co, 400 W Madison Ave, Chicago, Ill.
Kieley & Mueller Inc, 2015-2033 43rd St, N Bergen, N. J.
Limbert, Geo B, & Co, 570 Fulton St, Chicago, Ill.
McAlear Mfg Co, Chicago, Ill.
Marshall Heater Co, Dayton, O.
Moorehead Mfg Co, 4895 Grand River Ave, Detroit, Mich.
National Valve & Mfg Co, 3102 Liberty Ave, Pittsburgh Pa.
Adv page 200
Nicholson, W H, & Co, 125 Oregon St, Wilkes-Barre, Pa.
Adv pages 227, 269, 271
Plouff Co, 1150 Columbus Ave, Boston, Mass.
Schutte & Koerting Co, 12th & Thompson Sts, Phila, Pa.
Stickle Steam Specialties Co, 2217 Valley Ave, Indianapolis, Ind.
Straight Line Foundry & Machine Co, 218 S Geddes St, Syracuse, N. Y.
Strong, Carlisle & Hammond Co, 1392 W 3rd St, Cleveland, O.
Adv page 285
Swartwout Co, 18511 Euclid Ave, Cleveland, Ohio
Adv page 312
Webster, Warren & Co, Camden, N. J.
Adv page 272

SHIMS

Akron Metallic Gasket Co, 160 N Union St, Akron, Ohio
Adv page 228
Fitzgerald Mfg Co, Torrington, Conn.
Laminated Shim Co, 61 Union St, Glenbrook, Conn.
Phoenix Specialty Mfg Co, 155 Wooster St, New York, N. Y.
Victor Mfg & Gasket Co, Roosevelt Rd, Chicago, Ill.

SIGNAL SYSTEMS, ELECTRIC

American Elevator & Machine Co, Louisville, Ky.
Autocall Co, Shelby, Ohio
Bendix Aviation Corp, Marine Div, 754 Lexington Ave, Brooklyn, N. Y.
Graybar Electric Co, 420 Lexington Ave, New York, N. Y.
Adv pages 214, 234, 243, 261, 265, 282, 284
Signal Engrg & Mfg Co, 161 W 14th St, New York, N. Y.
Stephens-Adamson Mfg Co, 5 Ridgeway Ave, Aurora, Ill.
Adv page 175

SIRENS

Breuer Electric Co, 5100 N Ravenswood Ave, Chicago, Ill.
Foster Engineering Co, 109 Monroe St, Newark, N. J.
Adv pages 230, 257, 259, 276
Leslie Co, Lyndhurst, N. J.
Star Brass Mfg Co, 110 E Dedham St, Boston, Mass.

SKIP HOISTS

(See Hoists, Skip)

SLINGS, WIRE-ROPE

(See Rope, Wire)

SLUICING SYSTEMS, ASH

Allen-Sherman-Hoff Co, 227 S 15th St, Philadelphia, Pa.
Brady Conveyors Corp, 20 W Jackson Blvd, Chicago, Ill.
United Conveyor Corp, 37 W Van Buren St, Chicago, Ill.

SLUSHING COMPOUNDS

(See Compounds, Slushing)

SMOKE-DENSITY INDICATORS

Bailey Meter Co, 1036 Ivanhoe Rd, Cleveland, Ohio
Adv pages 14, 15
Brooke Engineering Co, Inc, 4517 Wayne, Philadelphia, Pa.
Ess Instrument Co, Fort Lee, N. J.
General Power Plant Corp, 512 5th Ave, New York, N. Y.
Leeds & Northrup Co, 4970 Stenton Ave, Philadelphia, Pa.
Adv page 2nd cover
Photoswitch, Inc, 21 Chestnut St, Cambridge, Mass.
Preferred Utilities Mfg Corp, New York, N. Y.
McNeill, T W, Engrg Equipment Co, 4059 W Van Buren St, Chicago, Ill.
Photoswitch, Inc, 21 Chestnut St, Cambridge, Mass.

SMOKE INDICATORS, VISUAL

Diamond Power Specialty Corp, Box 288 Detroit, Mich.
Adv pages 116, 117
Ess Instrument Co, Fort Lee, N. J.
McNeill, T W, Engrg Equipment Co, 4059 W Van Buren St, Chicago, Ill.

SNUBBERS, GAGE

(See Gage Snubbers)

SOCKETS, WIRE-ROPE

(See Rope, Wire)

SOFTENERS, WATER

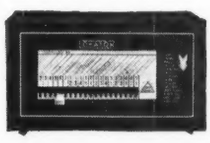
American Doucil Co, 121-124 S 3rd St, Philadelphia, Pa.
American Sand-Banum Co, Dept MP, 9 Rockefeller Plaza, New York, N. Y.
American Water Softener Co, 4th & Lehigh, Phila, Pa.
Chemical Solvent Co, Box 487 Birmingham, Ala.
Cochrane Corp, 3106 N 17th St, Philadelphia, Pa.
Adv pages 154, 233, 240, 261, 269
Crane Co, 836 S Michigan Ave, Chicago, Ill.
Adv page 123
Elgin Softener Corp, 130 N Grove Ave, Elgin, Ill.
Adv page 283
Filtrators Co, 96 Liberty St, New York, N. Y.
Hungerford & Terry Inc, Clayton N. J.
International Filter Co, 325 W 25th Place, Chicago, Ill.
Loomis-Manning Filter Mfg Co, 1421 S 37th St, Philadelphia, Pa.
Pennsylvania Salt Mfg Co, 1000 Widener Bldg, Phila, Pa.
Permutit Co, Dept A, 330 W 42nd St, New York, N. Y.
Adv pages 152, 159
Power Plant Specialty Co, 431 S Dearborn St, Chicago, Ill.
Scaife, Wm B, & Sons Co, River & Ann St, Oakmont, Pa.
Stover Steel Tank & Mfg Co, Freeport, Ill.
Water Treatment Co of America, 1159 Hodgkiss St, Pittsburgh, Pa.
Adv page 142
Worthington Pump & Machinery Corp, Harrison, N. J.
Adv page 171

SOOT BLOWERS

(See Blowers, Soot)

SIGNAL SYSTEMS
ELECTRIC

GraybaR QUALITY SINCE 1869 *REG. U.S. PAT. OFF.
Everything Electrical . . . . THAT IT TAKES TO WIN!



ONE ITEM OF THE GRAYBAR 60,000

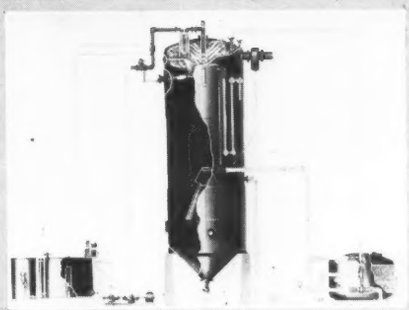
To fill every communication need Graybar offers Edwards Lokator, Webster Teletalk, Graybar Inter-Phone system and many other items including fire alarm equipment.

DISTRIBUTED BY

GraybaR ELECTRIC COMPANY

IN OVER 80 PRINCIPAL CITIES

Cochrane



Complete conditioning of boiler feedwater . . . Cochrane's specialty for over half-a-century.

HOT PROCESS WATER SOFTENING

The Cochrane Hot Process Softener is the most versatile method of external feedwater conditioning and it can be supplied to practically every water supply irrespective of its physical or chemical characteristics. Reagents are recommended suitable for the conditions involved in each individual plant.

ZEOLITE & CARBONACEOUS ZEOLITE SOFTENING

Cochrane offers Zeolite Water Softeners for all plants, large and small. All commonly known zeolites, including the green sands, as well as the carbonaceous types, are available.

SOFTENING AND DEAERATION

Complete softening and oxygen removal are accomplished in one piece of equipment in the Cochrane Deaerating Hot Process Softener.

COCHRANE CORPORATION • 3106 N. 17th ST., PHILADELPHIA, PA.

FEEDWATER SOFTENING

ONE ORGANIZATION TO HANDLE ALL WATER PROBLEMS

CONSULTATION and DESIGN

The solution of all problems relating to water conditioning is the business of the Betz Consulting Division whose services include:

- Analysis of Requirements
- Plant Design
- Preparation of Specifications
- Procurement of Bids
- Evaluation of Bids
- Supervision of Erection
- Acceptance Test Runs
- Personnel Operating Instruction
- Continuous Supervision and Service Maintenance

This consulting service is available for a complete plant or for any single step in design or operation. For information, write to the attention of our Consulting Division.

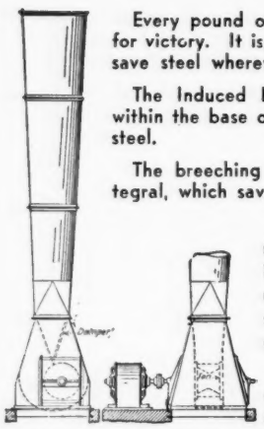
W. H. & L. D. BETZ

Consultants on ALL Water Problems

FRANKFORD • PHILADELPHIA • PENNA.

LABORATORIES AND ENGINEERS LOCATED THROUGHOUT U. S. A. AND CANADA

To Conserve Steel Use Thermix Stub Stacks



Every pound of steel must work to the limit for victory. It is, therefore, a patriotic duty to save steel wherever possible.

The Induced Draft Fan of Thermix is built within the base of a Thermix Stack, which saves steel.

The breeching between fan and stack is integral, which saves steel.

The diffusing Stub stack saves steel and converts velocity pressure (which is of no use to the boiler) to static suction, which is what is required.

Only one support is required for fan and stack, which saves steel.

There is unit responsibility for draft because all parts are combined into one apparatus, guaranteed to produce definite draft at its inlet.

Many other advantages of Thermix Stacks are explained in our Catalog No. 109. Write for a copy.

PRAT-DANIEL CORP., Port Chester, N. Y

General Sales Agents

THERMIX ENGINEERING CO., Greenwich, Conn.

Representatives in Principal Cities

SPEED INDICATORS
(See Tachometers)

SPEED REDUCERS
(See Gear Units, Power-Transmission)

SPRAY COOLING SYSTEMS
(See Cooling Systems, Spray)

SPREADER STOKERS
(See Stokers, Spreader)

SPRINKLER SYSTEMS, FIRE
Caldwell, W E, Co, 280 Brandeis St, Louisville, Ky.
Central Automatic Sprinkler Co, 261 E Ashmead St, Phila, Pa.
Grinnell Co, Inc, 227 W Exchange St, Providence, R. I.
Adv page 156
Rockwood Sprinkler Co, 54 Harlow St, Worcester, Mass.

STACKS, STEEL
(See Also Chimneys)
Alpha Tank & Sheet Metal Mfg Co, 5005 S 38th St, St. Louis, Mo.
Babcock & Wilcox Co, 85 Liberty St, New York, N. Y.
Adv pages 8, 9, 10, 11
Bass Foundry & Machine Div, 1602 Hanna St, Fort Wayne, Ind.
Bergen Point Iron Works, Bayonne, N. J.
Bethlehem Steel Co, Bethlehem, Pa.
Bigelow Co, 200-220 River St, New Haven, Conn.
Birchfield Boiler Inc, Tacoma, Wash.
Bos-Hatten, Inc, Buffalo, N. Y.
Bros, Wm, Boiler & Mfg Co, Nicollet Island, Minneapolis, Minn.
Brownell Co, 301 N Findlay St, Dayton, Ohio
Caldwell, W E, Co 280 Brandeis St, Louisville, Ky.
California Steel Products Co, Barrett & A Sts, Richmond, Cal.
Chattanooga Boiler & Tank Co, Box 110, Chattanooga, Tenn.
Chicago Bridge & Iron Co, 2454 McCormick Bldg, Chicago, Ill.
Colonial Iron Works Co, 17643 St. Clair Ave, Cleveland, Ohio
Combustion Engrg Co, Inc, 205 Madison Ave, New York, N. Y.
Adv pages 16, 17
Connery Construction Co, 2nd & Luzerne Sts, Phila, Pa.
Continental Chimney Co, 127 N Dearborn St, Chicago, Ill.
Dover Boiler Works, 90 E Dickerson St, Dover, N. J.
Drummond Mfg Co, Inc, Louisville, Ky.
Erie City Iron Works, 1422 East Ave, Erie, Pa.
Graver Tank & Mfg Co, Inc, East Chicago, Ill.
Hodge Boiler Works, East Boston, Mass.
International Engrg Works, Inc, Framingham, Mass.
Keeler, E, Co, Williamsport, Pa.
Adv page 125
Kirk & Blum Mfg Co, 2831 Spring Grove, Cincinnati, O.
Kroeschell Boiler, Racine, Wis.
Lakeside Bridge & Steel Co, Milwaukee, Wis.
Leader Iron Works, Inc, Decatur, Ill.
Littleford Bros, 457 E Pearl St, Cincinnati, O.
Adv page 185
Lockport Engrg Works, Inc, Lockport, N. Y.
McNally Pittsburg Mfg Co, Pittsburg, Kansas
Mead-Penn Iron Works Co, Meadville, Pa.
Mecklenburg Iron Works, P O Box 599, 617 N Summit St, Charlotte, N. C.
Michelmann Steel Constructior Co, Quincy, Ill.
Milwaukee Boiler Mfg Co, S 41st St, Milwaukee, Wis.
Murray Iron Works Company, Burlington, Iowa
Adv page 148
New Bedford Boiler & Machine Co, New Bedford, Mass.
Oldman Boiler Works, Inc, Buffalo, N. Y.
Pennsylvania Boiler Works, Erie, Pa.
Petroleum Iron Works Div, Beaumont, Texas
Pittsburgh Des Moines Steel Co, Neville Island, Pittsburgh, Pa.
Prat-Daniel Corp, 80 S Water St, Port Chester, N. Y.
Adv pages 212, 262
Quaker City Iron Works, Philadelphia, Pa.
Richmond Engrg Co, 7th & Hospital Sts, Richmond, Va.
Savage, W J, Co, Knoxville, Tenn.
Steacy-Schmidt Mfg, York, Pa.
Stearns-Roger Mfg Co, Denver, Colo.
Stover Steel Tank & Mfg Co, Freeport, Ill.
Titusville Iron Works Co, Titusville, Pa.
Treadwell, M H, Co, 140 Cedar St, New York, N. Y.
Union Boiler & Mfg Co, 52 Vanderbilt Ave, New York, N. Y.
Union Iron Works, Erie, Pa.
Wickes Boiler Co, 515 N Washington Ave, Saginaw, Mich.
Youngstown Steel Tank Co, Youngstown, Ohio

STEAM ACCUMULATORS
(See Accumulators, Steam)

STEAM-JET CONVEYORS
(See Conveyors, Pneumatic, Steam-Jet)

STEAM PURIFIERS
(See Purifiers, Steam)

STEAM SEPARATORS
(See Separators, Steam)

STOKERS, CHAIN-, TRAVELING-GRATE
Babcock & Wilcox Co, 85 Liberty St, New York, N. Y.
Adv pages 8, 9, 10, 11
Combustion Engrg Co, Inc, 205 Madison Ave, New York, N. Y.
Adv pages 16, 17
Illinois Stoker Co, Alton, Ill.
Johnston & Jennings Co, 878 Addison Rd, Cleveland, Ohio
(*Stowe compensating-feed stoker*)
Adv page 47
Laclede Stoker Co, 4440 Hunt Ave, St Louis, Mo.
McClave Co, 751 Mill St, Allentown, Pa.
Riley Stoker Corp, 999 Neponset St, Worcester, Mass.
Adv pages 96, 97
Stearns-Roger Mfg Co, Denver

STOKERS, OVERFEED
American Coal Burner Co, 155 E Superior St, Chicago, Ill.
Adv page 264
Canton Stoker Corp, 741 Andrew Place, Canton, O.
Adv page 184
Combustion Engrg Co, 205 Madison Ave, New York, N. Y.
Adv pages 16, 17
Detroit Stoker Co, General Motors Bldg, Detroit, Mich.
Adv page 263
Flynn & Emrich Co, 301 Holliday St, Baltimore, Md.
Hoffman Combustion Engrg Co, Marquette Bldg, Detroit, Mich.
Adv pages 22, 23
Johnston & Jennings Co, 878 Addison Rd, Cleveland, Ohio.
Adv page 47
Perfection Grate & Stoker Co, Springfield, Mass.
Whiting Stoker Co, 4711 W North Ave, Chicago, Ill.

STOKERS, SPREADER
American Coal Burner Co, 155 E Superior St, Chicago, Ill.
Adv page 264
Bros, Wm, Boiler & Mfg Co, Nicollet Id, Minneapolis, Minn.
Combustion Engrg Co, 205 Madison Ave, New York, N. Y.
Adv pages 16, 17
Detroit Stoker Co, General Motors Bldg, Detroit, Mich.
Adv page 263
Hoffman Combustion Engrg Co, Marquette Bldg, Detroit, Mich.
Adv pages 22, 23
Iron Fireman Mfg Co, 3295 W 106th St, Cleveland, Ohio
McClave Co, 751 Mill St, Allentown, Pa.
Whiting Stoker Co, 4711 W North Ave, Chicago, Ill.

STOKERS, UNDERFEED, MULTIPLE-RETORT
American Engrg Co, Aramingo Ave, Philadelphia, Pa.
Adv pages 12, 13

DETROIT STOKER COMPANY

Main Office and Works
Monroe, Mich.

Sales and Engineering Offices

General Motors Building, Detroit, Mich.

District Offices in Principal Cities

DETROIT STOKER COMPANY OF CANADA, LIMITED, *Canada Building, Windsor, Ontario*

Since 1898

PRODUCTS AND SERVICE

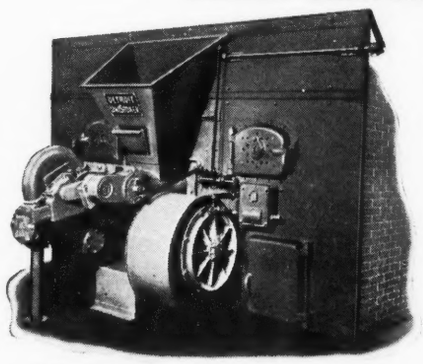
The purchaser is assured a Detroit Stoker, best suited to his particular boiler, the kind of coal, available and required capacity. Many types and sizes, include Underfeed and Spreader Stokers for all makes and types of boilers, described in catalogs which will be sent on request.

DETROIT LOSTOKER

DETROIT LOSTOKER

Adjustable plunger Feed, side cleaning Stoker. Many sizes for all boilers: Readily applied to firebox boilers, requiring no side or front wall brickwork. Stoker front, with ash removal doors, built to fit the boiler base. Coal hopper clears boiler doors. Compact and convenient to operate. Either motor driven or steam turbine driven if over 75 pounds steam pressure. Automatically controlled by steam pressure, hot water temperature or room thermostat. A great coal saver. Write for Bulletin 330.

DETROIT UNISTOKER

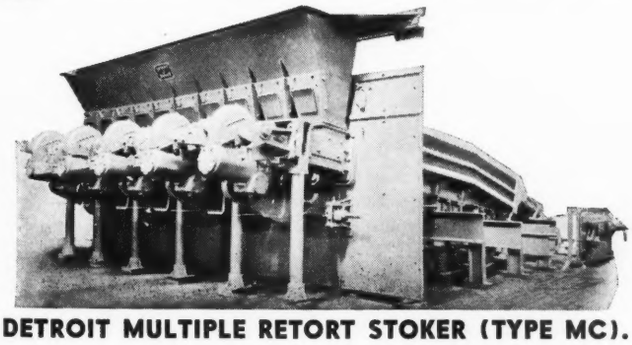


DETROIT UNISTOKER WITH DETROIT ADJUSTABLE FEED COAL FEED CONTROL.

Heavy duty, plunger feed, Stoker with full housed blower, either motor or turbine driven, mounted at the front. Efficient, independent, self-contained unit in sizes and capacities for all types of boilers from approximately 125 to 300 H.P. Detroit Adjustable Feed provides a wide range of automatic coal feed control. Bulletin 630.

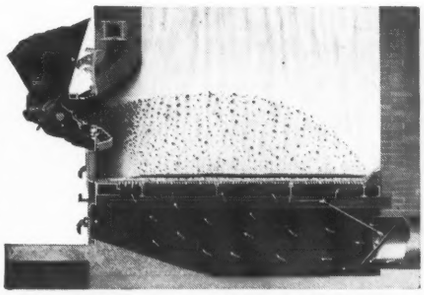
DETROIT MULTIPLE RETORT STOKER

Many outstanding features: Inclined retorts having a decreasing depth—Large square rams that operate in ram cases having adjustable liner plates—Moving retort bottoms insure uniform fuel distribution—Extension moving grates have a slicing action. For large boilers at high capacities. Bulletin 130.



DETROIT MULTIPLE RETORT STOKER (TYPE MC).

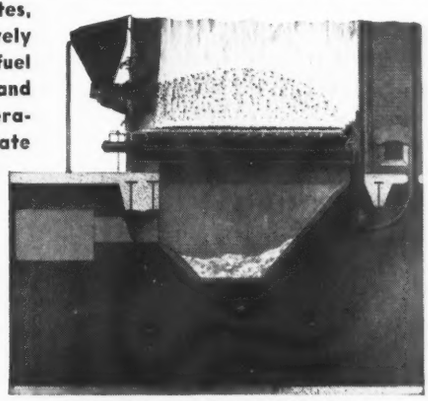
DETROIT ROTOSTOKER



DETROIT ROTOSTOKER (STATIONARY GRATE).

Curved Rotor Blades distribute the fuel uniformly sideways over the entire width of the furnace—operation—flexible, dependable and efficient with a wide variety of fuels.

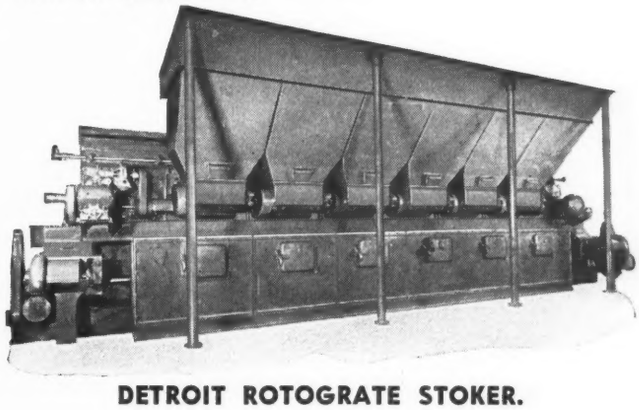
A solution for many combustion problems, offering distinct advantages over other firing methods, especially for handling fluctuating loads. Successfully burns a wide range of fuel. A spreader stoker with the OVER-THROW ROTOR action, that insures uniform fuel distribution. Fine particles of fuel are burned in suspension and the coarse coal on the grates, with a comparatively thin, but uniform fuel bed. Economical and dependable in operation, Stationary grate type is for medium boilers, if no basement is provided for ash removal. Power operated or Hand Dumping Grate Types are for larger boilers. Write for Bulletin 830.



DETROIT ROTOSTOKER (DUMPING GRATE).

DETROIT ROTOGRATE STOKER

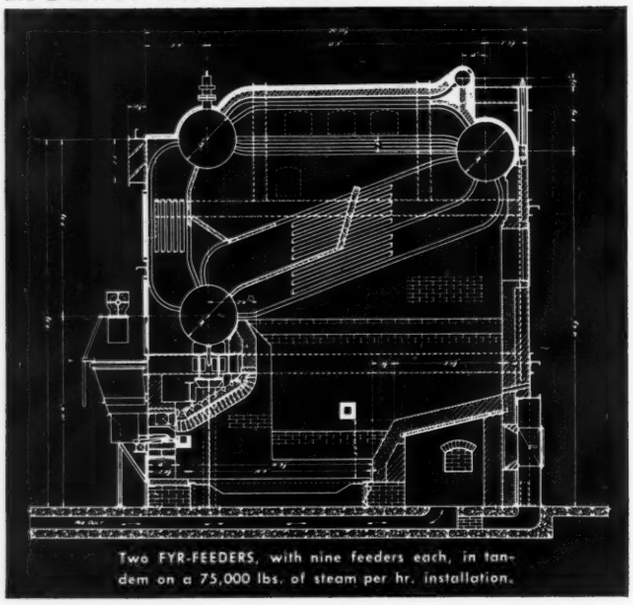
An entirely new system of burning a wide range of fuel. Fine particles are burned in suspension and the coarse coal on the Continuous Cleaning Grate that has a forward movement and delivers the ash at the front. Intermittent cleaning of fires or disturbance of uniform combustion, eliminated. Combustible content of ash is usually less than two percent. Fuels of high ash content successfully burned at high burning rates for long periods. Dependable operation for large boilers at high capacities. For medium and large steam generators. Write for bulletin 5030.



DETROIT ROTOGRATE STOKER.

FYR-FEEDER

MULTIPLE SPREADER STOKERS



Two FYR-FEEDERS, with nine feeders each, in tandem on a 75,000 lbs. of steam per hr. installation.

—The Answer to Wartime Firing Problems!

Fuel shortages, manpower shortages, transportation shortages and time shortages make FYR-FEEDER Spreader Stoker firing advantages more important than ever before.

FYR-FEEDERS

INCREASE BOILER CAPACITY — "Fire-over-fire" principle increases plant capacity with present boilers.

BURN WIDE RANGE OF COALS—You can draw on the nearest source of fuel and burn it efficiently with a FYR-FEEDER. Coal from 1½" size to dust, or even such fuel as sawdust or wood chips.

ARE EASY TO OPERATE—Simple, quickly responsive, easy to understand. An inexperienced man can successfully handle your firing in short order.

CONSERVE COAL—More efficient burning of fuel produces more steam per pound of coal.

PRODUCE STEAM QUICKER — Instantly and automatically responsive to sudden demands for steam; just as quick in letting go of a load.

CAN BE DELIVERED QUICKLY — The American Coal Burner Company is set up to make exceptionally good deliveries on rated orders. WRITE NOW FOR COMPLETE INFORMATION.

AMERICAN COAL BURNER CO.

ENGINEERS — Est. 1918

32-18 E. Erie Street - Chicago, Illinois

Clizbe Bros Mfg Co, Plymouth, Ind.
Combustion Engrg Co, Inc, 205 Madison Ave, New York, N. Y.
Adv pages 16, 17
Detroit Stoker Co, General Motors Bldg, Detroit, Mich.
Adv page 263
Hoffman Combustion Engrg Co, Marquette Bldg, Detroit, Mich.
Adv pages 22, 23
Riley Stoker Corp, 999 Neponset St, Worcester, Mass.
Adv pages 96, 97
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61

STOKERS, UNDERFEED, SINGLE-, DOUBLE-RETORT

Bros, Wm, Boiler & Mfg Co, Nicollet I, Minneapolis, Minn.
Brownell Co, 301 N Findlay St, Dayton, Ohio
Canton Stoker Corp, 741 Andrew Place, Canton, Ohio
Adv page 184
Clizbe Bros Mfg Co, Plymouth, Ind.
Combustioneer Div, Steel Prod Engrg Corp, Springfield, Ohio.
Combustion Engrg Co, Inc, 205 Madison Ave, New York, N. Y.
Adv pages 16, 17
Conco Engrg Works, Mendota, Ill.
Detroit Stoker Co, General Motors Bldg, Detroit, Mich.
Adv page 263
Fairbanks, Morse & Co, 600 S Michigan Ave, Chicago, Ill.
Flynn & Emrich Co, 301 Holliday St, Baltimore, Md.
Frederick Iron & Steel Co, Frederick, Md.
Hoffman Combustion Engrg Co, Marquette Bldg, Detroit, Mich.
Adv page 22-23
Iron Fireman Mfg Co, 3295 W 106th St, Cleveland, Ohio
Leffel, James & Co, Springfield, Ohio
Link-Belt Co, 2410 W 18th St, Chicago, Ill.
Adv page 3
McClave Co, 751 Mill St, Allentown, Pa.
Meyer Furnace Co, Peoria, Pa.
Perfection Grate & Stoker Co, Springfield, Mass.
Riley Stoker Corp, 999 Neponset St, Worcester, Mass.
Adv pages 96, 97
U. S. Machine Corp, Lebanon, Ind.
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61

STORAGE BATTERIES

(See Batteries, Storage)

STORAGE SYSTEMS, COAL

Bartlett & Snow, C O, Co, Cleveland, Ohio
Beaumont Birch Co, 1505 Race St, Philadelphia, Pa.
Brady Conveyors Corp, 20 W Jackson Blvd, Chicago, Ill.
Bros, Wm, Boiler & Mfg Co, Nicollet Id, Minneapolis, Minn.
Chain Belt Co, 1674 W Bruce St, Milwaukee, Wis.
Fairfield Engrg Co, 305 Barnhart St, Marion, Ohio
Gifford-Wood Co, 24 Hill St, Hudson, N. Y.
Hahn Engrg Div, 233 Broadway, New York, N. Y.
Jeffrey Mfg Co, 932-99 N 4th St, Columbus, Ohio
Lidgerwood Mfg Co, Elizabeth, N. J.
Link-Belt Co, 300 W Pershing Rd, Chicago, Ill.
Adv page 3
Robins Conveying Belt Co, Passaic, N. J.
Adv page 188
Sauerman Bros, Inc, 562 S Clinton St, Chicago, Ill.
Adv page 264
Savage, W J, Co, Knoxville, Tenn.
Stearns-Roger Mfg Co, Denver, Colo.
Stephens-Adamson Mfg Co, 5 Ridgeway Ave, Aurora, Ill.
Adv page 175

STRAINERS, GAS, AIR

Alco Valve Co, 2628 Big Bend Blvd, St Louis, Mo.
Andale Co, 1600 Arch, Phila, Pa.
Blackmer Pump Co, 1904C Century Ave, Grand Rapids, Mich.

SAUERMAN

POWER SCRAPERS FOR STOCKPILING

Cheaper and Better Coal Storage

WITH a Sauerman Power Drag Scraper you can store more coal safely in a given space and the entire cost will be only a couple of cents per ton stored and reclaimed.

A Sauerman Scraper layers the coal into the pile, avoiding objectionable segregation. The resulting pile is homogeneous, no matter how high it is carried. Chances for deterioration and spontaneous combustion are reduced to a minimum. There is a size and type of Sauerman machine for every coal storage project, large or small. Write for catalog.

SAUERMAN BROS., INC., 562 S. Clinton St., Chicago

Burgess Battery Co, Acoustic Div, 2815 W Roscoe St, Chicago, Ill.
Adv page 244
Cash, A W, Co, 402 N Eldorado St, Decatur, Ill.
Cash Universal Regulator Co, Marshalltown, Iowa.
Crane Co, 836 S Michigan Ave, Chicago, Ill.
Adv page 123
Cuno Engrg Corp, Meriden, Conn.
Davis Regulator Co, 2540 S Washtenaw Ave, Chicago, Ill.
Detroit Lubricator Co, 5900 Trumbull Ave, Detroit, Mich.
Eddington Metal Specialty Co, Box K, Eddington, Pa.
Adv pages 244, 252
Edward Valve & Mfg Co, 1150 W 145th St, E Chicago, Ind.
Adv page 277
Electric Valve Mfg Co, 67 Murray St, New York, N. Y.
Fisher Governor Co, 203 S 1st Ave, Marshalltown, Iowa
General Controls Co, 810 Allen Ave, Glendale, Calif.
Illinois Engrg Co, Racine Ave & 21st St, Chicago, Ill.
Keckley, O C, Co, 400 W Madison St, Chicago, Ill.
Kraissl Co, Hackensack, N. J.
Leslie Co, Lyndhurst, N. J.
McAlear Mfg Co, Chicago, Ill.
Mason-Neilan Regulator Co, 1186 Adams St, Boston, Mass.
Mueller Co, Decatur, Ill.
Sarco Co, Inc, 475 5th Ave, New York, N. Y.
Schade Valve Mfg Co, 2527 N Bodine St, Philadelphia, Pa.
Staples & Pfeiffer, Ltd, San Francisco, Calif.
Staynew Filter Corp, Rochester, N. Y.
Tryco Products Inc, 1 Railroad Ave, Westfield, Mass.
Wright-Austin Co, Detroit, Mich.

STRAINERS, OIL

Andale Co, 1600 Arch, Phila, Pa.
Anderson, V D, 1934 W 96th St, Cleveland, Ohio
Anthony Co, 47-33 5th St, Long Island City, N. Y.
Bell & Gossett Co, Chicago, Ill.
Blackmer Pump Co, 1940C Century Ave, Grand Rapids, Mich.
Bowser, S F, & Co, 1302 E Creighton, Fort Wayne, Ind.
Cash, A W, Co, 402 N Eldorado St, Decatur, Ill.
Cash Universal Regulator Co, Marshalltown, Iowa.
Chicago Flexible Shaft Co, Roosevelt Rd, Chicago, Ill.
Coen Co, 40 Boardman Place, San Francisco, Calif.
Crane Co, 836 S Michigan Ave, Chicago, Ill.
Adv page 123
Cuno Engrg Corp, Meriden, Conn.
Davis Regulator Co, 2540 S Washtenaw Ave, Chicago, Ill.
Detroit Lubricator Co, 5900 Trumbull Ave, Detroit, Mich.
Eddington Metal Specialty Co, Box K, Eddington, Pa.
Adv pages 244, 252
Edward Valve & Mfg Co, 1150 W 145 St, E Chicago, Ind.
Adv page 277
Electric Valve Mfg Co, 67 Murray St, New York, N. Y.
Elliott Co, Jeannette, Pa.
Adv pages 4, 5, 187
Fisher Governor Co, 203 S 1st Ave, Marshalltown, Iowa.
Foster Engrg Co, 109 Monroe St, Newark, N. J.
Adv pages 230, 257, 259, 276
Foster Pump Works Inc, 50 Washington St, Brooklyn, N. Y.
Gaso Pump & Burner Mfg Co, Tulsa, Okla.
General Controls Co, 810 Allen Ave, Glendale, Calif.
Granberg Equipment Inc, 1307 67th St, Oakland, Cal.
Hayward Mfg Co, 505 Court St, Brooklyn, N. Y.
Keckley, O C, Co, 400 W Madison St, Chicago, Ill.
Kieley & Mueller Inc, 2015-2033 43rd St, N Bergen, N. J.
Kinney Mfg Co, 3529 Washington St, Boston, Mass.
Kraissl Co, Hackensack, N. J.
Leahy Mfg Co, Los Angeles, Cal.
Leslie Co, Lyndhurst, N. J.
McAlear Mfg Co, Chicago, Ill.
Mason-Neilan Regulator Co, 1186 Adams St, Boston, Mass.
Monarch Mfg Works, 2731 E Westmoreland St, Phila, Pa.
Morrison Bros Co, Dubuque, Iowa
Mueller Co, Decatur, Ill.
National Airoil Burner Co, 1284 E Sedgley Ave, Phila, Pa.
Newark Wire Cloth Co, 355-369 Verona Ave, Newark, N. J.
Nugent, Wm W, & Co, 402 N Hermitage Ave, Chicago, Ill.
Preferred Utilities Mfg Corp, New York, N. Y.
Sarco Co, Inc, 475 5th Ave, New York, N. Y.
Schade Valve Mfg Co, 2527 N Bodine St, Philadelphia, Pa.
Schutte & Koerting Co, 12th & Thompson Sts, Phila, Pa.
Spence Engrg Co, Inc, 61 Grant St, Walden, N. Y.
Staples & Pfeiffer Ltd, 528 Bryant St, San Francisco, Calif.
Staynew Filter Corp, Rochester, N. Y.
Wright-Austin Co, Detroit Mich.

STRAINERS, STEAM

American District Steam Co, 70 Bryant St, N Tonawanda, N. Y.
Adv page 160
Anderson, V D, Co, 1934 W 96th St, Cleveland, Ohio
Atwood & Morrill Co, Salem, Mass.
Carling Turbine Blower Co, 25 St. John's Rd, Worcester, Mass.
Cash, A W, Co, 402 N Eldorado St, Decatur, Ill.
Cash Universal Regulator Co, Marshalltown, Iowa
Cashin, W D, Co, 69 A St, Boston, Mass.
Crane Co, 836 S Michigan Ave, Chicago, Ill.
Adv page 123
Davis Regulator Co, 2540 S Washtenaw Ave, Chicago, Ill.
Dunham, C A, Co, 450 E Ohio St, Chicago, Ill.
Eddington Metal Specialty Co, Box K, Eddington, Pa.
Adv pages 244, 252
Edward Valve & Mfg Co, 1150 W 145th St, E Chicago, Ind.
Adv page 277
Electric Valve Mfg Co, 67 Murray St, New York, N. Y.
Fisher Governor Co, 203 S 1st Ave, Marshalltown, Iowa
Foster Engrg Co, 109 Monroe St, Newark, N. J.
Adv pages 230, 257, 259, 276
General Controls, 810 Allen Ave, Glendale, Calif.
Goyne Steam Pump Co, Ashland, Pa.
Illinois Engrg Co, Racine Ave & 21st St, Chicago, Ill.
Keckley, O C, Co, 400 W Madison St, Chicago, Ill.
Kieley & Mueller, Inc, 2015-2033 43rd St, N Bergen, N. J.
Leahy Mfg Co, Los Angeles, Cal.
Leslie Co, Lyndhurst, N. J.
McAlear Mfg Co, Chicago, Ill.
Marsh, Jas P, Corp, 2049 Southport Ave, Chicago, Ill.
Mason-Neilan Regulator Co, 1186 Adams St, Boston, Mass.
Mueller Co, Decatur, Ill.
Newark Wire Cloth Co, 355-369 Verona Ave, Newark, N. J.
Sarco Co, Inc, 475 5th Ave, New York, N. Y.
Schade Valve Mfg Co, 2527 N Bodine St, Philadelphia, Pa.
Schutte & Koerting Co, 12th & Thompson Sts, Philadelphia, Pa.
Spence Engrg Co, Inc, 61 Grant St, Walden, N. Y.
Staples & Pfeiffer, Ltd, 528 Bryant St, San Francisco, Cal.
Sterling Inc, Milwaukee, Wis.
Strong, Carlisle & Hammond Co, 1392 W 3rd St, Cleveland, Ohio
Tryco Products, Inc., 1 Railroad Ave, Westfield, Mass.
Webster, Warren, & Co, Camden, N. J.
Adv page 272
Wright-Austin Co, Detroit, Mich.

STRAINERS, WATER

American District Steam Co, 70 Bryant St, N Tonawanda, N. Y.
Adv page 160
Andale Co, 1600 Arch, Philadelphia, Pa.
Anderson, V D, 1934 W 96th St, Cleveland, Ohio.
Anthony Co, 47-33 5th St, Long Island City, N. Y.
Atwood & Morrill Co, Salem, Mass.
Barrett, Haentjens & Co, Hazleton, Pa.
Blackmer Pump Co, 1904C Century Ave, Grand Rapids, Mich.
Cash, A W, Co, 402 N Eldorado St, Decatur, Ill.
Cash Universal Regulator Co, Marshalltown, Iowa.
Cashin, W D, Co, 69 A St, Boston, Mass.
Cuno Engrg Corp, Meriden, Conn.
Davis Regulator Co, 2540 S Washtenaw Ave, Chicago, Ill.
Detroit Lubricator Co, 5900 Trumbull Ave, Detroit, Mich.
Eddington Metal Specialty Co, Box K, Eddington, Pa.
Adv pages 244, 252
Edward Valve & Mfg Co, 1150 W 145th St, E Chicago, Ind.
Adv page 277
Electric Valve Mfg Co, 67 Murray St, New York, N. Y.
Elliott Co, Jeannette, Pa.
Adv pages 4, 5, 187
Fisher Governor Co, 203 S 1st Ave, Marshalltown, Iowa
Foster Engrg Co, 109 Monroe St, Newark, N. J.
Adv pages 230, 257, 259, 276
Foster Pump Works, Inc, 50 Washington St, Brooklyn, N. Y.
General Controls Co, 810 Allen Ave, Glendale, Calif.
Golden-Anderson Valve Specialty Co, 1315 Fulton Bldg, Pittsburgh, Pa.
Adv page 140
Keckley, O C, Co, 400 W Madison St, Chicago, Ill.
Kieley & Mueller Inc, 2015-2033 43rd St, N Bergen, N. J.
Kinney Mfg Co, 3529 Washington St, Boston, Mass.
Kraissl Co, Hackensack, N. J.
Leslie Co, Lyndhurst, N. J.
McAlear Mfg Co, Chicago, Ill.
McDonnell & Miller, Wrigley Bldg, Chicago, Ill.
Mason-Neilan Regulator Co, 1186 Adams St, Boston, Mass.
Marsh, Jas P, Corp, 2049 Southport Ave, Chicago, Ill.
Monarch Mfg Works, 2731 E Westmoreland St, Phila, Pa.
Newark Wire Cloth Co, 355-369 Verona Ave, Newark, N. J.
Sarco Co, Inc, 475 5th Ave, New York, N. Y.
Schade Valve Mfg Co, 2527 N Bodine St, Philadelphia, Pa.
Schutte & Koerting Co, 12th & Thompson Sts, Phila, Pa.
Spence Engrg Co Inc, 61 Grant St, Walden, N. Y.
Spray Engrg Co, 111 Central St, Somerville, Mass.
Staples & Pfeiffer, Ltd, 528 Bryant St, San Francisco, Calif.
Staynew Filter Corp, Rochester, N. Y.
Swartwout Co, 18511 Euclid Ave, Cleveland, Ohio
Adv page 312
Watson-Stillman Co, Roselle, N. J.
Adv page 226
Wright-Austin Co, Detroit, Mich.
Yarnall-Waring Co, Chestnut Hill, Philadelphia, Pa.
Adv page 109

STROBOSCOPES

Alemite Div, 1826 W Diversey Pkwy, Chicago, Ill.
General Electric Co, Schenectady, N. Y.
Adv pages 32, 33
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61

SUPERHEATERS

Babcock & Wilcox Co, 85 Liberty St, New York, N. Y.
Adv pages 8, 9, 10, 11
Bros, Wm, Boiler & Mfg Co, Nicollet Id, Minneapolis, Minn.
Combustion Engrg Co, Inc, 205 Madison Ave, New York, N. Y.
Adv pages 16, 17
Edge Moor Iron Works, 30 Rockefeller Plaza, New York, N. Y.
Adv page 182
Foster Wheeler Corp, 165 Broadway, New York, N. Y.
Adv pages 38, 39
Keeler, E, Co, Williamsport, Pa.
Adv page 125
Riley Stoker Corp, 999 Neponset St, Worcester, Mass.
Adv pages 96, 97
Union Iron Works, Erie, Pa.

SWITCHBOARDS

Allen-Bradley, Milwaukee, Wisconsin
Allis-Chalmers Mfg Co, Milwaukee, Wis.
Adv pages 6, 7
Bardco Mfg & Sales Co, 3725 Wilshire Blvd, Los Angeles, Calif.
Bogue Electric Co, 80 Glover Ave, Paterson, N. J.
Burlington Instrument Corp, 316 Valley St, Burlington, Iowa
Climax Engrg Co, 1003 Allen Bldg, Dallas Tex.
Cutler-Hammer Inc, 315 N 12th St, Milwaukee, Wis.
Adv page 107
General Electric Co, Schenectady, N. Y.
Adv pages 32, 33
Graybar Electric Co, 420 Lexington Ave, New York, N. Y.
Adv pages 214, 234, 243, 261, 265, 282, 284
Hanson-Van Winkle-Munning Co, Matewan, N. J.
I-T-E Circuit Breaker Co, 19th & Hamilton Sts, Philadelphia, Pa.
Metropolitan Electric Mfg Co, 22-48 Steinway, Long Island City, N. Y.
Roller-Smith Co, 1766 W Market St, Bethlehem, Pa.
Adv page 206
Square D Co, Rivard & Piquette Sts, Detroit, Mich.
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61

SWITCHES, ELECTRIC

(See Also, Breakers, Circuit)
Adam, Frank, Electric Co, Windsor Pl, St Louis, Mo.
Allen-Bradley Co, Milwaukee, Wis.
Allis-Chalmers Mfg Co, Milwaukee, Wis.
Adv pages 6, 7

ONE ITEM OF THE GRAYBAR 60,000

Indoor switches and outdoor switches. Switches for every power, light and signaling need.

DISTRIBUTED BY

GraybaR ELECTRIC COMPANY

IN OVER 80 PRINCIPAL CITIES

Arrow-Hart & Hegeman Elect Co, 105 Hawthorn, Hartford, Conn.
Automatic Switch Co, 41 E 11th St, New York, N. Y.
Bryant Electric Co, Bridgeport, Conn.
Clark Controller Co, 1146 E 152nd St, Cleveland, Ohio
Colt's Patent Fire Arms Mfg Co, Hartford, Conn.
Cutler-Hammer, Inc, 315 N 12th St, Milwaukee, Wis.
Adv page 107
Delta-Star Electric Co, Fulton St, Chicago, Ill.
Electric Controller & Mfg Co, 2700 E 79th St, Cleveland, Ohio
G & W Electric Specialty Co 7780 Dante Ave, Chicago, Illinois
General Electric Co, Schenectady, N. Y.
Adv pages 32, 33
Graybar Electric Co, 420 Lexington Ave, New York, N. Y.
Adv pages 214, 234, 243, 261, 265, 282, 284
I-T-E Circuit Breaker Co, 19th & Hamilton Sts, Phila, Pa.
Jefferson Electric Co, Bellwood, Ill.
McDonnell & Miller, Wrigley Bldg, Chicago, Ill.
Metropolitan Electric Mfg Co, 22-48 Steinway, Long Island City, N. Y.
Monitor Controller Co, Baltimore, Md.
Ohmite Mfg Co, 4819 Flournoy St, Chicago, Ill.
Pacific Electric Mfg Corp, 5815 3rd St, San Francisco, Calif.
Penn Electric Switch Co, Goshen, Ind.
Railway & Industrial Engrg Co, Greensburg, Pa.
Roller-Smith Co, 1766 West Market St, Bethlehem, Pa.
Adv page 206
Schweitzer & Conrad, 4433 Ravenswood, Chicago, Ill.
Southern States Equipment Corp, Birmingham, Ala.
Square D Co, Rivard & Piquette Sts, Detroit, Mich.
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60-61
Zenith Electric Co, 845 S Wabash Ave, Chicago, Ill.

SYNCHRONIZERS AUTOMATIC

Allis-Chalmers Mfg Co, Milwaukee, Wis.
Adv pages 6, 7
Bardco Mfg & Sales Co, 3725 Wilshire Blvd, Los Angeles
Burlington Instrument Corp, 316 Valley St, Burlington, Iowa
Electric Machinery Mfg Co, 1331 Tyler St, N E, Minneapolis, Minn.
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61

SYNCHROSCOPES

Burlington Instrument Corp, 316 Valley St, Burlington, Ia.
General Electric Co, Schenectady, N. Y.
Adv pages 32, 33
Roller-Smith Co, 1766 W Market St, Bethlehem, Pa.
Adv page 206
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61
Weston Electrical Instrument Corp, 614 Frelinghuysen Ave, Newark, N. J.
Adv pages 202, 267

TACHOMETERS

Alemite Div, 1826 W Diversey Pkwy, Chicago, Ill.
Bailey Meter Co, 1036 Ivanhoe Rd, Cleveland, Ohio
Adv pages 14, 15
Biddle, James G, Co, 1211-13 Arch St, Philadelphia, Pa.
Adv page 138
Boulin Instrument Corp, 65 Madison Ave, New York, N. Y.
Bristol Co, Waterbury, Conn.
Brown Instrument Co, 4490 Wayne Ave, Philadelphia, Pa.
Adv pages 51, 240, 254, 258, 266
Coats Machine Tool Co, 17 Tudor Lane, Scarsdale, N. Y.
Durant Mfg Co, 1954 N Buffum St, Milwaukee, Wis.
Esterline-Angus Co, Box 596, Indianapolis, Ind.
Foxboro Co, 38 Neponset Ave, Foxboro, Mass.
General Electric Co, Schenectady, N. Y.
Adv pages 32, 33
Leeds & Northrup Co, 4970 Stenton Ave, Philadelphia, Pa.
Adv Second Cover
Scherr, George, Co, 126 Lafayette St, New York, N. Y.
Veeder-Root, Inc, Hartford, Conn.

Look for the noun in the product listing, for example:

"Valves, Regulating"

not

"Regulating Valves"

Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61
Weston Electrical Instrument Corp, 614 Frelinghuysen Ave, Newark, N. J.
Adv pages 202, 267
Zernickow, O, Co, 21 Park Row, New York, N. Y.

TANKS, CAST-IRON

Brady Conveyors Corp, 20 W Jackson Blvd, Chicago, Ill.
Hahn Engrg Div, 233 Broadway, New York, N. Y.
Koppers Co, Pittsburgh, Pa.
Meehanite Corp, Dept A, 311 Ross St, Pittsburgh, Pa.
National Conveyors Co, 50 Church St, New York, N. Y.
United Conveyor Corp, 37 W Van Buren St, Chicago, Ill.
Warren Foundry & Pipe Corp, 11 Broadway, New York, N. Y.
Weber Engine Co, 12th & Winchester Sts, Kansas City, Mo.

TANKS, ICE

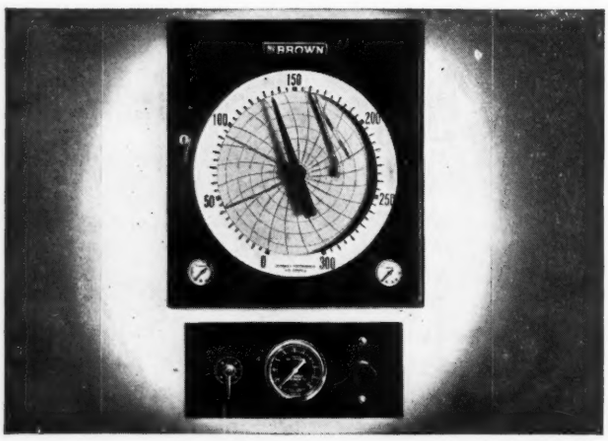
Alpha Tank & Sheet Metal Mfg Co, 5005 S 38th St, St. Louis, Mo.
Baker Ice Machine Co, Inc, Omaha, Neb.
Caldwell, W E, Co, Inc, 280 Brandeis St, Louisville, Ky.
California Steel Products Co, Barrett & A Sts, Richmond, Cal.
Frick Co, 325 Broadway, Waynesboro, Pa.
International Engrg Works, Inc Framingham, Mass.
Long, Walter, Mfg Co, Pittsburgh, Pa.
Richmond Engrg Co, 7th & Hospital Sts, Richmond, Va.
Vilter Mfg Co, 2217 S 1st St, Milwaukee, Wis.
Vogt, Henry, Machine Co, 1000 W Ormsby St, Louisville, Ky.
Adv page 46
York Ice Machy Corp, York, Pa.

TANKS, STEEL

Alco Products Div, 36 Church St, New York, N. Y.
Adv pages 56, 155
Alpha Tank & Sheet Metal Mfg Co, 5005 S 38th St, St Louis, Mo.
American Welding Co, 30 Church St, New York, N. Y.
Babcock & Wilcox Co, 85 Liberty St, New York, N. Y.
Adv pages 8, 9, 10, 11
Bass Foundry & Machine Div, 1602 Hanna St, Fort Wayne, Ind.
Bethlehem Steel Co, Bethlehem, Pa.
Bigelow Co, 200-220 River St, New Haven, Conn.
Birchfield Boiler Inc, Tacoma, Wash.
Black, Sivalls & Bryson, Inc, Oklahoma City, Okla.
Blaw-Knox Co, Pittsburgh, Pa.
Adv pages 24, 25
Bos-Hatten, Inc, Buffalo, N. Y.
Bros, Wm, Boiler & Mfg Co, Nicollet Id, Minneapolis, Minn.
Brownell Co, 301 N Findlay St, Dayton, Ohio
Caldwell, W E, Co, Inc, 280 Brandeis St, Lousiville, Ky.
California Steel Products Co, Barrett & A Sts, Richmond, Cal.
Chicago Bridge & Iron Co, 2554 McCormick Bldg, Chicago, Ill.
Cochrane Corp, 3106 N 17th St, Philadelphia, Pa.
Adv pages 154, 233, 240, 261, 269
Colonial Iron Works Co, 17643 St. Clair Ave, Cleveland, O.
Combustion Engrg Co, Inc, 205 Madison Ave, New York, N. Y.
Adv pages 16, 17
Connery Construction Co, 2nd & Luzerne Sts, Phila, Pa.
Edge Moor Iron Works, 30 Rockefeller Plaza, New York, N. Y.
Adv page 182
Farrar & Trefts, Buffalo, N. Y.
Frick Co, Inc, 325 Broadway, Waynesboro, Pa.
Gifford-Wood Co, 24 Hill St, Hudson, N. Y.
Graver Tank & Mfg Co, Inc, East Chicago, Ill.
Hauser-Stander Tank Co, Cincinnati, Ohio
Hodge Boiler Works, East Boston, Mass.
International Engineering Works, Inc, Framingham, Mass.
Jones & Laughlin Steel Corp, Pittsburgh, Pa.
Kewanee Boiler Corp, Kewanee, Ill.
Kirk & Blum Mfg Co, 2831 Spring Grove Ave, Cincinnati, O.
Koppers Co, Pittsburgh, Pa.
Lakeside Bridge & Steel Co, Milwaukee, Wis.
Leader Iron Works, Inc, Decatur, Ill.
Littleford Bros, 457 E Pearl St, Cincinnati, Ohio
Long, Walter, Mfg Co, Pittsburgh, Pa.
McNally Pittsburg Mfg Co, Pittsburg, Kansas
Marshall Heater Co, Dayton, Ohio
Mecklenburg Iron Works, P. O. Box 599, Charlotte, N. C.
Michelmann Steel Construction Co, Quincy, Ill.
Morrison Bros Co, Dubuque, Iowa
Murray Iron Works Co, Burlington, Iowa
Adv page 148
National Lead Co, 111 Broadway, New York, N. Y.
Patterson-Kelley Co, E Stroudsburg, Pa.
Petroleum Iron Works Div, Beaumont, Texas
Pfaudler Co, Rochester, N. Y.
Pittsburgh-Des Moines Steel Co, Neville Island, Pittsburgh, Pa.
Richmond Engrg Co, 7th & Hospital Sts, Richmond, Va.
Scaife, Wm B, & Sons Co, River & Ann St, Oakmont, Pa.
Stearns-Roger Mfg Co, Denver, Colo.
Stover Steel Tank & Mfg Co. Freeport, Ill.
Straight Line Foundry & Machine Co, 218 S Geddes St, Syracuse, N. Y.
Titusville Iron Works Co, Titusville, Pa.
Treadwell, M H, Co, 140 Cedar St, New York, N. Y.
Union Boiler & Mfg Co, 52 Vanderbilt Ave, New York, N. Y.
Union Iron Works, Erie, Pa.
Vogt, Henry, Machine Co, 1000 W Ormsby St, Louisville, Ky.
Adv page 46
Whitlock Mfg Co, 77 South St, Hartford, Conn.
Adv page 232
Wickes Boiler Co, 515 N Washington Ave, Saginaw, Mich.
Youngstown Steel Tank Co, Youngstown, Ohio

TANKS, WOOD

Arrow Tank Co, Inc, Buffalo, N. Y.
Black, Sivalls & Bryson, Inc, Oklahoma City, Okla.
Caldwell, W E, Co, Inc, 280 Brandeis St, Louisville, Ky.



A New Principle for Measuring and Controlling Temperatures up to 3200° F.

The Brown *"Continuous Balance"* Air-o-Line Potentiometer Controller is the culmination of more than three-quarters of a century of experience in building industrial measurement and control instruments.

In this radically new potentiometer controller a *"Continuous Balance"* Unit takes the place of the galvanometer used in the conventional mechanical-type potentiometer employing a periodic or cyclic mechanism.

The *"Continuous Balance"* measuring system makes it possible to take full advantage of thermocouple responsiveness. Positive control action is assured by the well-known, dependable Brown Air-o-Line Control Unit, thousands of which are in service throughout industry.

The Brown Circular Chart Air-o-Line Potentiometer Controller brings to industry, for the first time, the ideal synchronization of measurement and control for temperature processes.

THE BROWN INSTRUMENT COMPANY, a division of Minneapolis-Honeywell Regulator Co., 4490 Wayne Avenue, Philadelphia, Pa.

BROWN "CONTINUOUS BALANCE" **POTENTIOMETER**

Accurate Measurement with Simplicity

Davis, G M, & Son, Palatka, Fla.
Hauser-Stander Tank Co, Cincinnati, Ohio
Kalamazoo Tank & Silo Co, Kalamazoo, Mich.
New England Tank & Tower Co, Everett, Mass.

THERMOCOUPLES

Brown Instrument Co, 4490 Wayne Ave, Philadelphia, Pa.
Adv pages 51, 240, 254, 258, 266
Engelhard, Charles, Inc, 234 N J RR Ave, Newark, N. J.
Foxboro Co, 38 Neponset Ave, Foxboro, Mass.
General Electric Co, Schenectady, N. Y.
Adv pages 32, 33
Leeds & Northrup Co, 4970 Stenton Ave, Philadelphia, Pa.
Adv second cover
Natural Gas Equipment, Inc, 539 Petroleum Bldg, Los Angeles, Calif.
Wheelco Instruments Co, 863 W Harrison St, Chicago, Ill.
Adv pages 203, 216, 254, 258

THERMOMETERS, GLASS

Bristol Co, Waterbury, Conn.
Burrell Technical Supply Co, 1936 5th Ave, Pittsburgh, Pa.
Eimer & Amend, 635 Greenwich St, New York, N. Y.
Johnson Service Co, 509 E Michigan St, Milwaukee, Wis
Manning, Maxwell & Moore, Inc, Bridgeport, Conn.
Palmer Co, 2501-A Norwood Ave, Cincinnati, Ohio
Tagliabue, C J, Mfg Co, Park & Nostrand Aves, Brooklyn, N. Y.
Taylor Instrument Cos, Rochester, N. Y.
U. S. Gauge Co, 44 Beaver St, New York, N. Y.
Adv page 227

THERMOMETERS, INDUSTRIAL

Bailey Meter Co, 1036 Ivanhoe Rd, Cleveland, Ohio
Adv pages 14, 15
Bristol Co, Waterbury, Conn.
Brown Instrument Co, 4490 Wayne Ave, Philadelphia, Pa.
Adv pages 51, 240, 254, 258, 266
Defender Automatic Regulator Co, St Louis, Mo.
Foxboro Co, 38 Neponset Ave, Foxboro, Mass.
Johnson Service Co, 507 E Michigan St, Milwaukee, Wis.
Leeds & Northrup Co, 4970 Stenton Ave, Philadelphia, Pa.
Adv second cover
Manning, Maxwell & Moore, Bridgeport, Conn.
Marsh, J P, & Co, 2049 Southport Ave, Chicago, Ill.
Palmer Co, 2501-A Norwood Ave, Cincinnati, Ohio
Pierce Butler Radiator Corp, 701 Nichols Ave, Syracuse, N. Y.
Powers Regulator Co, 2771-2 Greenview Ave, Chicago, Ill.
Tagliabue, C J, Mfg Co, Park & Nostrand Aves, Brooklyn, N. Y.
Taylor Instrument Cos, 95 Ames St, Rochester, N. Y.
U S Gauge Co, 114 Beaver St, New York N. Y.
Adv page 227
Weston Electrical Instrument Corp, 614 Frelinghuysen Ave, Newark, N. J.
Adv pages 202, 267
Wheelco Instruments Co, 863 W Harrison St, Chicago, Ill.
Adv pages 203, 216, 254, 258

THERMOMETERS, REMOTE-READING

Bailey Meter Co, 1036 Ivanhoe Rd, Cleveland, Ohio
Adv pages 14, 15
Bristol Co, Waterbury, Conn.
Brown Instrument Co, 4490 Wayne Ave, Philadelphia, Pa.
Adv pages 51, 240, 254, 258, 266
Cochrane Corp, 3106 N 17th St, Philadelphia, Pa.
Adv pages 154, 233, 240, 261, 269
Defender Automatic Regulator Co, St Louis, Mo.
Edison, Thomas A, Inc, West Orange, N. J.
Foxboro Co, 38 Neponset Ave, Foxboro, Mass.
Hotstream Heater Co, 8007 Grand Ave, Cleveland, Ohio
Johnson Service Co, 507 E Michigan St, Milwaukee, Wis.
Leeds & Northrup Co, 4970 Stenton Ave, Philadelphia, Pa.
Adv second cover
Manning, Maxwell & Moore, Bridgeport, Conn.
Marsh, J P, & Co, 2049 Southport Ave, Chicago, Ill.
Mason-Neilan Regulator Co, 1186 Adams St, Boston, Mass.
Minneapolis-Honeywell Regulator Co, 2747 4th Ave S, Minneapolis, Minn.
Palmer Co, 2501-A Norwood Ave, Cincinnati, Ohio
Powers Regulator Co, 2771-2 Greenview Ave, Chicago, Ill.
Republic Flow Meters Co, 2222 Diversey Pkwy, Chicago, Ill.
Adv pages 215, 221, 241, 280
Sarco Co, 475 5th Ave, New York, N. Y.
Tagliabue, C J, Mfg Co, Park & Nostrand Aves, Brooklyn, N. Y.
Taylor Instrument Cos, 95 Ames St, Rochester, N. Y.
U S Gauge Co, 44 Beaver St, New York, N. Y.
Adv page 227
Wheelco Instruments Co, 863 W Harrison St, Chicago, Ill.
Adv pages 203, 216, 254, 258

THERMOSTATS, DUCT, SURFACE

Allen-Bradley Co, Milwaukee, Wis.
Armstrong Heat Control Co, Portland, Ore.
Barber Colman Co, Rockford, Ill.
Burling Instrument Co, 253 Springfield Ave, Newark, N. J.
Defender Automatic Regulator Co, St Louis, Mo.
Detroit Lubricator Co, 5900 Trumbull Ave, Detroit, Mich.
Edison, Thomas A, Inc, West Orange, N. J.
Fenwal, Inc, 100 Main St, Ashland, Mass.
Friez, Julien P, Div, 4 N Central Ave, Baltimore, Md.
Johnson Service Co, 507 E Michigan St, Milwaukee, Wis.
Mercoid Corp, 4229 Belmont Ave, Chicago, Ill.
Minneapolis-Honeywell Regulator Co, 2747 4th Ave S, Minneapolis, Minn.
Penn Electric Switch Co, Goshen, Ind.
Powers Regulator Co, 2771-2 Greenview Ave, Chicago, Ill.
Taylor Instrument Cos, 95 Ames St, Rochester, N. Y.
Vapor Car Heating Co, 80 East Jackson Blvd, Chicago, Ill.
Vulcan Electric Co, 88-90 Holten St, Danvers, Mass.
Wheelco Instruments Co, 863 W Harrison St, Chicago, Ill.

THERMOSTATS, EFFECTIVE-TEMPERATURE

Barber Colman Co, Rockford, Ill.
Defender Automatic Regulator Co, St Louis, Mo.
Friez, Julien P, Div, 4 N Central Ave, Baltimore, Md.
General Electric Co, Schenectady, N. Y.
Adv pages 32, 33
Johnson Service Co, 507 E Michigan St, Milwaukee, Wis.
Vapor Car Heating Co, 80 East Jackson Blvd, Chicago, Ill.

THERMOSTATS, IMMERSION

Allen-Bradley Co, Milwaukee, Wis.
Armstrong Heat Control Co, Portland, Ore.
Atlas Valve Co, 289 South St, Newark, N. J.
Barber Colman Co, Rockford, Ill.
Bristol Co, Waterbury, Conn.
Burling Instrument Co, 253 Springfield Ave, Newark, N. J.
Defender Automatic Regulator Co, St Louis, Mo.
Detroit Lubricator Co, 5900 Trumbull Ave, Detroit, Mich.
Edison, Thomas A, Inc, West Orange, N. J.
Fenwal, Inc, 100 Main St, Ashland, Mass.
Friez, Julien P, Div, 4 N Central Ave, Baltimore Md.
General Controls Co, 810 Allen Ave, Glendale, Calif.
Johnson Service Co, 507 E Michigan St, Milwaukee, Wis.
Klipfel Mfg Co, 2651 W Harrison St, Chicago, Ill.
Mercoid Corp, 4229 Belmont Ave, Chicago, Ill.
Minneapolis-Honeywell Regulator Co, 2747 4th Ave S, Minneapolis, Minn.
Natural Gas Equipment, Inc, 539 Petroleum Bldg, Los Angeles, Calif.
Penn Electric Switch Co, Goshen, Ind.
Powers Regulator Co, 2771-2 Greenview Ave, Chicago, Ill.
Sarco Co, 475 5th Ave, New York, N. Y.
Taylor Instrument Cos, 95 Ames St, Rochester, N. Y.
Vapor Car Heating Co, 80 East Jackson Blvd, Chicago, Ill.

THERMOSTATS, ROOM OR WALL

Allen-Bradley Co, Milwaukee, Wis.
American Radiator & Std Sanitary Corp, 40 W 40th St, New York, N. Y.
Armstrong Heat Control Co, Portland, Ore.
Barber Colman Co, Rockford, Ill.
Detroit Lubricator Co, 5900 Trumbull Ave, Detroit, Mich.
Edison, Thomas A, Inc, West Orange, N. J.
Friez, Julien P, Div, 4 N Central Ave, Baltimore, Md.
General Controls Co, 810 Allen Ave, Glendale, Calif.
General Electric Co, Schenectady, N. Y.
Adv pages 32, 33
Johnson Service Co, 507 E Michigan St, Milwaukee, Wis.
Manning, Maxwell & Moore, Bridgeport, Conn.
Mercoid Corp, 4229 Belmont Ave, Chicago, Ill.
Minneapolis-Honeywell Regulator Co, 2747 4th Ave S, Minneapolis, Minn.
Natural Gas Equipment, Inc, 539 Petroleum Bldg, Los Angeles, Cal.
Penn Electric Switch Co, Goshen, Ind.
Powers Regulator Co, 2771-2 Greenview Ave, Chicago, Ill.
Sarco Co, 475 5th Ave, New York, N. Y.
Triplex Heating Specialty Co, Peru, Ind.
Vapor Car Heating Co, 80 East Jackson Blvd, Chicago, Ill.

THERMOSTATS, 2-TEMPERATURE

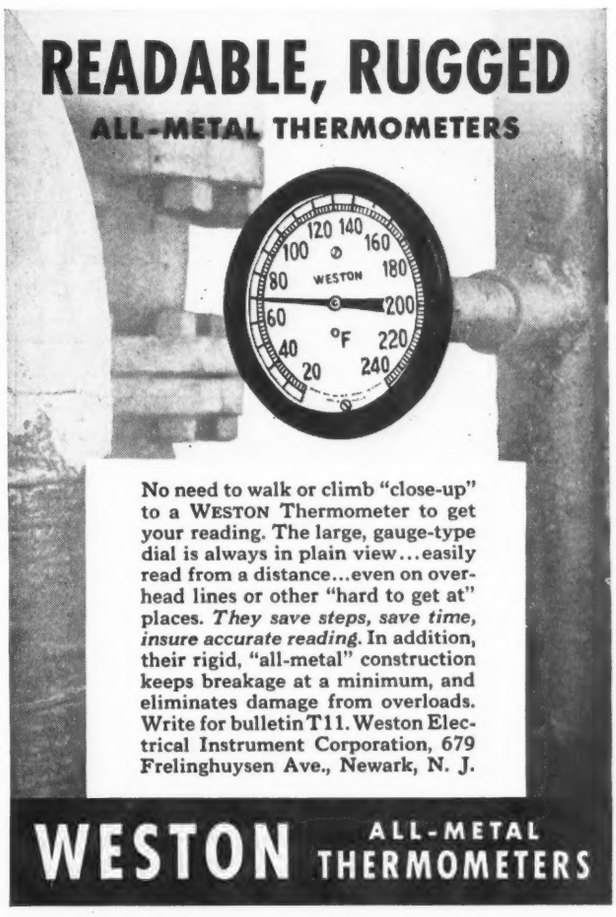
American Radiator & Std Sanitary Corp, 40 W 40th St, New York, N. Y.
Armstrong Heat Control Co, Portland, Ore.
Barber Colman Co, Rockford, Ill.
Burling Instrument Co, 253 Springfield Ave, Newark, N. J.
Friez, Julien P, Div, 4 N Central Ave, Baltimore, Md.
General Controls Co, 810 Allen Ave, Glendale, Calif.
General Electric Co, Schenectady, N. Y.
Adv pages 32, 33
Johnson Service Co, 507 E Michigan St, Milwaukee, Wis.
Marsh Tritrol Co, 600 S Michigan Ave, Chicago, Ill.
Mercoid Corp, 4229 Belmont Ave, Chicago, Ill.
Minneapolis-Honeywell Regulator Co, 2747 4th Ave S, Minneapolis, Minn.
Powers Regulator Co, 2771-2 Greenview Ave, Chicago, Ill.
Taylor Instrument Cos, 95 Ames St, Rochester, N. Y.
Ulanet, George, Co, 92 E Kinney St, Newark, N. J.
Vapor Car Heating Co, 80 East Jackson Blvd, Chicago, Ill.

THERMOSTATS, WEATHER-COMPENSATING

Barber Colman Co, Rockford, Ill.
Detroit Lubricator Co, 5900 Trumbull Ave, Detroit, Mich.
Johnson Service Co, 507 E Michigan St, Milwaukee, Wis.
Marsh Tritrol Co, Chicago, Ill.
Minneapolis-Honeywell Regulator Co, 2747 4th Ave S, Minneapolis, Minn.
Vapor Car Heating Co, 80 East Jackson Blvd, Chicago, Ill.

TOOL BOXES

(See Boxes, Tool)


READABLE, RUGGED
ALL-METAL THERMOMETERS
WESTON
No need to walk or climb "close-up" to a WESTON Thermometer to get your reading. The large, gauge-type dial is always in plain view...easily read from a distance...even on overhead lines or other "hard to get at" places. They save steps, save time, insure accurate reading. In addition, their rigid, "all-metal" construction keeps breakage at a minimum, and eliminates damage from overloads. Write for bulletin T11. Weston Electrical Instrument Corporation, 679 Frelinghuysen Ave., Newark, N. J.
WESTON ALL-METAL THERMOMETERS

Certainly the Cooling Tower Deserves a Firm Structural Support

but the support to demand FIRST is a Strong Responsible Manufacture

The maker's background, integrity and ability to meet his commitments are just as much a part of the cooling tower purchase as any of its *physical* features. They are the vital protection against delays, troubles and less-than-rated performance that impede production of urgently needed war goods.

Even plants which will cease activities at the end of hostilities cannot afford to be without this protection... from the very start.

★ **FACILITIES and RESOURCES** — PLANTS, EQUIPMENT, PERSONNEL INVENTORIES, ETC., of the calibre to execute *all* contracts of any magnitude *quickly* and smoothly.

★ **BROAD EXPERIENCE** — SEASONED PRODUCTS backed by the accumulated "know-how" of many hundreds of applications annually covering all types and capacities in every variety of service.

★ **ESTABLISHED RECORD** — CONSISTENTLY LARGE OUTPUT steadily swelling a broad list of installations. HEAVY REPEAT BUSINESS from nationally-known firms.

★ **COMPLETE SERVICE**—REPRESENTATIVES in all major cities to provide *confidential consultation* and engineering analysis of application problems. SOUND ADAPTATIONS to meet individual requirements and conditions. VETERAN ERECTION SUPERVISORS to direct fast skilled installation by capable crews. WAREHOUSE STOCKS of replacement items. FIELD TEST SERVICE equipped to make operating studies.

★ **LEADERSHIP** — PROVEN DEVELOPMENTS both in general designs and component features. REPUTATION for originality and numerous "firsts." CONTINUOUS RESEARCH contributing to the advancement of the industry.

You know you get these from MARLEY and you know it's worth the difference

10-42-A

MARLEY COOLING TOWERS

Every MARLEY TOWER *is individually engineered by* THE MARLEY CO., INC. — KANSAS CITY, KANSAS

TOWERS, COOLING

Binks Mfg Co, 3114-40 Carroll Ave, Chicago, Ill.
Braun, C F, & Co, 1000 S Fremont Ave, Alhambra, Calif.
Buffalo Forge Co, 488 Broadway, Buffalo, N. Y.
Adv page 199
Fluor Corp Ltd, 2500 S Atlantic Ave, Los Angeles, Calif.
Foster Wheeler Corp, 165 Broadway, New York, N. Y.
Adv pages 38, 39
Lilie-Hoffman Cooling Towers, 4239 Duncan Ave, St. Louis, Mo.
Lummus Co, 420 Lexington Ave, New York, N. Y.
Adv page 192
Marley Co, Fairfax Rd & Marley Ave, Kansas City, Kans.
Adv page 268
Murray, D J, Mfg Co, Wausau, Wis.
New England Cooling Tower Co, 32 Cambridge St, Charlestown, Mass.
Pritchard, J F, Co, Dwight Bldg, Kansas City, Mo.
Schubert-Christy Corp, 1600 Georgia St, Affton Station, St. Louis, Mo.
Wheeler, C H, Mfg Co, Lehigh & Sedgley Aves, Phila, Pa.
Young Radiator Co, Racine, Wis.

TRANSFORMERS, ELECTRIC

Acme Electric & Mfg Co, 220 E 23rd St, New York, N. Y.
Allis-Chalmers Mfg Co, Milwaukee, Wis.
Adv pages 6, 7
Erie Electric Co, 124 Church St, Buffalo, N. Y.
Forbes & Myers, 174 Union St, Worcester, Mass.
General Electric Co, Schenectady, N. Y.
Adv pages 32, 33
Graybar Electric Co, 420 Lexington Ave, New York, N. Y.
Adv pages 214, 234, 243, 261, 265, 282, 284
Jefferson Electric Co, Bellwood, Ill.
Wagner Electric Corp, St. Louis, Mo.
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61

TRANSMISSIONS, VARIABLE-SPEED, HYDRAULIC

American Blower Co, 6000 Russell St, Detroit, Mich.
American Engrg Co, Aramingo Ave, Philadelphia, Pa.
Adv pages 12, 13
Oilgear Co, 1421 W Bruce St, Milwaukee, Wis.
Twin Disc Clutch Co, Racine, Wis.
Vickers, Inc, Detroit, Mich.
Waterbury Tool Co, Waterbury, Conn.

TRANSMISSIONS, VARIABLE-SPEED, MECHANICAL, ELECTRICAL

Allis-Chalmers Mfg Co, Milwaukee, Wis.
Adv pages 6, 7
Columbia Vari-Speed Co, 137 Liberty Drive, Wheaton, Ill.
Dynamatic Corp, Kenosha, Wis.
Electric Machinery Mfg Co, 1331 Tyler St, N E, Minneapolis, Minn.
Elliott Co, Jeannette, Pa.
Adv pages 4, 5, 187
Graham Transmissions, Inc, Milwaukee, Wis.
Ideal Commutator Dresser Co, 1025 Park Ave, Sycamore, Ill.
Janette Mfg Co, 556 West Monroe St, Chicago, Ill.
Lewellen Mfg Co, Maple Ave, Columbus, Ind.
Link-Belt Co, 2045 Hunting Park Ave, Philadelphia, Pa.
Adv page 3
Moore & White Co, Philadelphia, Pa.
Morse Chain Co, Ithaca, N. Y.
Adv page 26
Reeves Pulley Co, 1000 N Reed St, Columbus, Ind.
Robbins & Myers Inc, Springfield, Ohio
Standard Transmission Equip Co, 416 W 8th St, Los Angeles, Calif.
Stephens-Adamson Mfg Co, 5 Ridgeway Ave, Aurora, Ill.
Adv page 175
Sterling Electric Motors, Inc, Los Angeles, Calif.
U. S. Electrical Motors, Inc, 200 E Slauson Ave, Los Angeles, Cal.
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61

TRAPS, COMPRESSED-AIR

(See Also Strainers)

Anderson, V D, Co, 1934 W 96th St, Cleveland, Ohio
Armstrong Machine Works, 812 Maple St, Three Rivers, Wis.
Adv pages 236, 270
Cryer Trap & Valve Co, 366 Madison Ave, New York, N. Y.
Adv page 271
Illinois Engineering Co, Racine Ave & 21st St. Chicago, Ill.
Kaye & McDonald Inc, 91 Franklin Ave, West Orange, N. J.
Keckley, O C, Co, 400 W Madison St, Chicago, Ill.
McAuley Trap Co, Dept 702, 405 Penn Ave, Pittsburgh, Pa.
Moorehead Mfg Co, Detroit.
Nicholson, W H, & Co, 125 Oregon St, Wilkes-Barre, Pa.
Adv pages 227, 269, 271
Sarco Co, 475 5th Ave, New York, N. Y.
Squires, C E, Co, 40th St & Kelley Ave, Cleveland, Ohio
Adv page 287
Staynew Filter Corp, Rochester, N. Y.
Sterling Engineering & Mfg Corp, Business St, Hyde Park, Boston, Mass.
Swartwout Co, 18511 Euclid Ave, Cleveland, Ohio
Adv page 312
Wright-Austin Co, Detroit, Mich.

TRAPS, RETURN

Anderson, V D, Co, 1934 W 96th St, Cleveland, Ohio
Cashin, W D, Co, 69 A St, Boston, Mass.
Crane Co, 836 S Michigan Ave, Chicago, Ill.
Adv page 123
Dunham, C A, Co, 450 E Ohio St, Chicago, Ill.
Hoffman Specialty Co, Inc, 1001 York St, Indianapolis, Ind.
Illinois Engrg Co, Racine Ave & 21st St, Chicago, Ill.
Johnson Corp, 865 Wood St, Three Rivers, Mich.
Kieley & Mueller Inc, 2015-2033 43rd St, No Bergen, N. J.
McAlear Mfg Co, Chicago, Ill.
Marsh, Jas P, Corp, 2049 Southport Ave, Chicago, Ill.
Mears-Kane Ofeldt Inc, 1903 E Haggert St, Philadelphia, Pa.
Milwaukee Valve Co, Milwaukee, Wis.
Monash-Younker Co, 1315 W Congress St, Chicago, Ill.
Moorehead Mfg Co, Detroit, Mich.
Plouff Co, 1150 Columbus Ave, Boston, Mass.
Reading-Pratt & Cady Div, Reading, Pa.
Adv pages 176, 177
Sarco Co, 475 5th Ave, New York, N. Y.
Schaub, Fred H, Engrg Co, 325 W Huron St, Chicago, Ill.
Sterling Engineering & Mfg Co, Business St, Boston, Mass.
Sterling Inc, Milwaukee, Wis.
Stickle Steam Specialties Co, 2217 Valley, Indianapolis, Ind.
Strong, Carlisle & Hammond Co, 1392 W 3rd St, Cleveland, O.
Adv page 285
Swartwout Co, 18511 Euclid Ave, Cleveland, Ohio
Adv page 312
Trane Co, 2012 Cameron Ave, La Crosse, Wis.

TRAPS, STEAM

American District Steam Co, 70 Bryant St. N Tonawanda, N.Y.
***Adv page* 160**

NICHOLSON

THERMOSTATIC STEAM TRAPS

LARGE CAPACITY—two to six times greater valve area than average.
NO AIR BINDING—All types discharge air as efficiently as water.
NO FREEZE-UPS—they drain completely when cold.
NO ADJUSTMENT—use same size valve and seat from vacuum to maximum pressure.
NO DRIBBLING—water-sealed discharge trap wide open when cold—shut upon contact with steam.
FOUR TYPES—cover every industrial trap requirement.

Write for Construction Details and Prices

W.H. NICHOLSON & CO.
125 Oregon Street Wilkes-Barre, Pennsylvania.

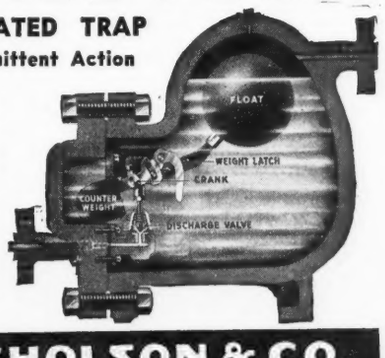
NICHOLSON

WEIGHT-OPERATED TRAP

Automatic Intermittent Action

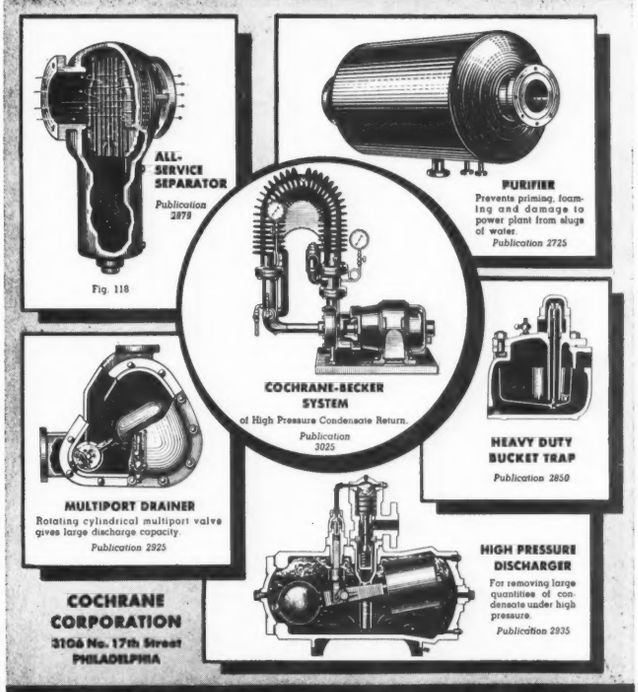
Designed and built to meet all the requirements of a trap for modern high pressure power plants and refineries. Model C is especially recommended for draining Headers, Line Purifiers, Separators, Superheated Drains, Turbine Throttle Valve Drips, Pressure Reducing Valves, etc. Large capacity, positive action. Handles pressures up to 1500 lbs. at 1000° max. temperature.

Write today for Catalog 941



W.H. NICHOLSON & CO.
125 Oregon Street Wilkes-Barre, Pennsylvania.

Cochrane



SEPARATORS • PURIFIERS • DRAINERS
CONDENSATE RETURN SYSTEMS
TRAPS • DISCHARGERS • RELIEF VALVES

For Every Installation
For Every Application

ARMSTRONG INVERTED BUCKET STEAM TRAPS

- Semi-steel traps for low and medium pressures.
- Forged steel traps for high pressures.
- Compound traps for large condensate loads.
- Blast traps for fast air removal.
- Special traps for other services.

BLAST TRAP — Patented thermic vent provides FAST discharge of large quantities of air.

WHATEVER your condensate drainage job and whatever the installation problem, there is an Armstrong Inverted Bucket Steam Trap to best meet the situation! Built for pressures as high as 2,400 lbs. and virtually any capacity, they offer advantages that mean longer and more efficient service.

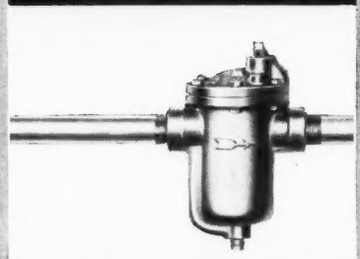
Typical of reports on Armstrong efficiency are these . . . An investment of $125.00 for Armstrong Traps saved 12 gallons of fuel oil per hour for a packing company . . . Thirty-two Armstrong traps cut average trap maintenance time from 20 man-days per month to only one man-day per month . . . Seven Armstrong Traps eliminated the need for a new boiler for a canning company.*

Write today for further information on how Armstrong Inverted Bucket Steam Traps can help to conserve fuel, metal, and manpower and step up production as well.

ARMSTRONG MACHINE WORKS
812 Maple Street • Three Rivers, Mich.

*Names of these plants will be furnished on request.

For Neatest Possible Hook-ups and Minimum Piping



Side Inlet – Side Outlet

Bottom Inlet – Top Outlet

Side Inlet–Bottom Outlet

The Cap Carries the Whole Works

ARMSTRONG "INVERTED BUCKET" STEAM TRAP TRADE MARK

ARMSTRONG MACHINE WORKS

Manufacturers of Steam Traps, Steam-Type Humidifiers, Refrigeration System Purgers, Air Traps

Anderson, V D, Co, 1934 W 96th St, Cleveland, Ohio
Armstrong Machine Works, 812 Maple St, Three Rivers, Mich.
Adv pages 236, 270
Atwood & Morrill Co, Salem, Mass.
Barnes & Jones Inc, 128 Brookside Ave, Jamaica Plain, Mass.
Cashin, W D, Co, 69 A St, Boston, Mass.
Cochrane Corp, 3106 N 17th St, Philadelphia, Pa.
Adv pages 154, 233, 240, 261, 269
Coe Mfg Co, Painesville, Ohio
Crane Co, 836 S Michigan Ave, Chicago, Ill.
Adv page 123
Cryer Trap & Valve Co, 366 Madison Ave, New York, N. Y.
Adv page 271
Davis Engrg Corp, 1064-16 E Grand St, Elizabeth, N. J.
Davis Regulator Co, 2540 S Washtenaw Ave, Chicago, Ill.
Dunham, C A, Co, 450 E Ohio St, Chicago, Ill.
Fisher Governor Co, 203 S 1st Ave, Marshalltown, Iowa
Haines, Wm S, Co, 12th & Buttonwood Sts, Philadelphia, Pa.
Hoffman Specialty Co, Inc, 1001 York St, Indianapolis, Ind.
Illinois Engrg Company, Racine Ave & 21st St, Chicago, Ill.
Johnson Corp, 865 Wood St, Three Rivers, Mich.
Kaye & McDonald, Inc, 91 Franklin Ave, West Orange, N. J.
Keckley, O C, Co, 400 W Madison St, Chicago, Ill.
Kieley & Mueller Inc, 2015-2033 43rd St, No Bergen, N. J.
Klipfel Mfg Co, 2651 W Harrison St, Chicago, Ill.
Limbert, Geo B, & Co, 570 Fulton St, Chicago, Ill.
McAlear Mfg Co, Chicago, Ill.
McAuley Trap Co, 405 Pennsylvania Ave, Pittsburgh, Pa.
Marsh, Jas P, Corp, 2049 Southport Ave, Chicago, Ill.
Milwaukee Valve Co, Milwaukee, Wis.
Minneapolis-Honeywell Regulator Co, 2747 4th Ave S, Minneapolis, Minn.
Monash-Younker Co, W Congress St, Chicago, Ill.
Moorehead Mfg Co, Detroit, Mich.
Nason Co, Lafayette & Mt Elliot Sts, Detroit, Mich.
Nicholson, W H, & Co, 125 Oregon St, Wilkes-Barre, Pa.
Adv pages 227, 269, 271
Powers Regulator Co, 2771-2 Greenview Ave, Chicago, Ill.
Reading-Pratt & Cady Div, Reading, Pa.
Adv pages 176, 177
Sarco Co, Inc, 475 5th Ave, New York, N. Y.
Schaub, Fred H, Engrg Co, 325 W Huron St, Chicago, Ill.
Squires, C E, Co, E 40th St & Kelley Ave, Cleveland, O.
Adv page 287
Sterling Engineering & Mfg Co, Business St, Boston, Mass.
Stickle Steam Specialties Co, 2217 Valley Ave, Indianapolis, Ind.
Strong, Carlisle & Hammond Co, 1392 W 3rd St, Cleveland, O.
Adv page 285
Swartwout Co, 18511 Euclid Ave, Cleveland, Ohio
Adv page 312
Tagliabue, C J, Mfg Co, Park & Nostrand, Brooklyn, N. Y.
Trane Co, 2012 Cameron Ave, LaCrosse, Wis.
Webster, Warren, & Co, Camden, N. J.
Adv page 272
Williams Gauge Co, 1938 Penna. Ave, N S, Pittsburgh, Pa.
Adv page 274
Wright-Austin Co, Detroit, Mich.
Yarnall-Waring Co, Chestnut Hill, Philadelphia, Pa.
Adv pages 109, 239, 244, 275, 283

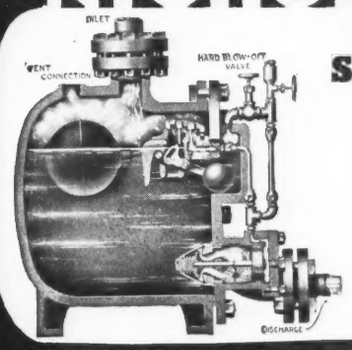
TREADS, FLOOR AND STAIR

American Abrasive Metals Co, Irvington, N. J.
Arrowhead Iron Works, 431 W 5th St, Kansas City, Mo.
Bates, Walter, Co, 208 S La Salle St, Chicago, Ill.
Adv page 230
Blaw-Knox Co, Pittsburgh, Pa.
Adv pages 24, 25
Hendrick Mfg Co, Carbondale, Pa.
Irving Subway Grating Co, 50-09 27th St, Long Island City, N. Y.
Kirk & Blum Mfg Co, 2831 Spring Grove Ave, Cincinnati, O.
Klemp, William F Co, 6651 S Melvina Ave, Chicago, Ill.
Norton Co, Worcester, Mass.
Ryerson, Jos T, & Son Inc, 16th & Rockwell Sts, Chicago, Ill.
Tri-Lok Co, 5515 Butler St, Pittsburgh, Pa.
Universal Safety Tread, Inc, Lowell, Mass.

TUBES, BOILER, SUPERHEATER

Allegheny Ludlum Steel Corp, Pittsburgh, Pa.
Babcock & Wilcox Co, 85 Liberty St, New York, N. Y.
Adv pages 8, 9, 10, 11
Bethlehem Steel Co, Bethlehem, Pa.
Boiler Tube Co of America, 3126 Preble Ave, Pittsburgh, Pa.
Detroit Seamless Tube Co, Detroit, Mich.
Globe Steel Tubes Co, 4051 W Burnham St, Milwaukee, Wis.
Adv page 151
Jones & Laughlin Steel Co, Pittsburgh, Pa.
Michigan Steel Tubes Products Co, 9540 Buffalo St, Detroit, Mich.
National Tube Co, Pittsburgh, Pa.
Ohio Seamless Tube Co, Shelby, Ohio
Pittsburgh Pipe Coil & Bending Co, Pittsburgh, Pa.
Pittsburgh Steel Co, 1659 Grant Bldg, Pittsburgh, Pa.
Ryerson, Jos T, & Son Inc, 16th & Rockwell Sts, Chicago, Ill.
Steel & Tubes Div, Republic Steel Corp, 218 E 131st St, Cleveland, Ohio

NICHOLSON



PISTON-OPERATED
STEAM TRAP
Preferred by Engineers everywhere.

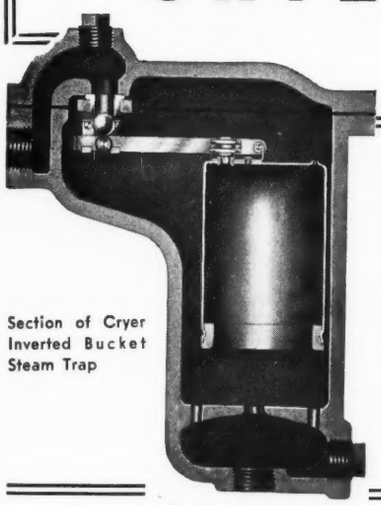
A positive, instantaneous, high pressure trap which occupies smaller space yet has greater capacity than any others available. The discharge valve is non-wire-drawing type, being entirely open or closed at all times. All valves, seats and working parts are of stainless steel for long trouble-free operation . . for Super-Pressures and Super-Heat in the Super-Power Plant.

Write for Operating Details.

W. H. NICHOLSON & CO.
125 Oregon Street Wilkes-Barre, Pennsylvania.

CRYER STEAM TRAPS

SIZES ½" TO 2½"
CAPACITIES 500 TO 38000# WATER
PRESSURES 0 TO 250#



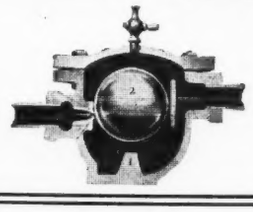
Section of Cryer Inverted Bucket Steam Trap

A PERMANENT CURE FOR TRAP TROUBLES WITH PERFORMANCE GUARANTEED

Featuring:

ACCESSIBILITY — all mechanism easily removed without disconnecting piping.
POSITIVE ACTION—correct seating insured by free turning ball.
QUICK VENT—air quickly discharged through mechanically controlled quick venting valve.
LARGE CAPACITY—sudden surges prevented by baffle plates from lifting bucket and closing valve.
NO BINDING—air completely discharged before condensate.
LONG LIFE—stainless steel wearing parts; ball valve is free turning to insure minimum wear.
EASILY INSTALLED—inlet connections accessible bottom or side; no special supports.
GUARANTEED PERFORMANCE — will discharge condensate at rated capacities and operate satisfactorily within limits of pressure and capacity or MONEY BACK.

Write at once for complete details

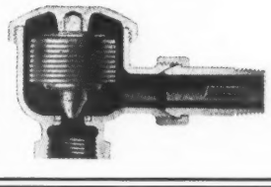


THE CRYER BALL STEAM TRAP
(Formerly known as the J-M Trap)

The utmost in simplicity, efficiency and long wear. More than a million in service. A seamless copper ball is the only moving part. Made in sizes from ¾" to 2" and in capacities from 600 to 8000 lbs. water per hour. Also made in ½" "Junior" Model. Details on request.

CRYER THERMOSTATIC RADIATOR TRAP

Permits water, air and gases to pass from radiator into return line but prevents steam from passing. Special alloy bellows construction and special stainless steel removable seat. Single type in ½" and ¾" sizes—for pressures up to 10 lbs. Full details on request.



CRYER TRAP & VALVE CO., INC.
• MANUFACTURERS OF STEAM SPECIALTIES FOR MORE THAN 40 YEARS •
366 MADISON AVE., NEW YORK, N. Y.

To blast the enemy out of the sky . . .

20,000 anti-aircraft guns in 1942 . . .

35,000 anti-aircraft guns in 1943 . . .

That is America's promise to the Victory Program—and America is going to beat that promise.

We are building a new America of huge new plants . . . enlarging facilities to insure ever-increasing production of weapons needed so urgently by our armed forces.

Behind this tremendous building program is steam. For steam serves America in war, as in peace. Steam, harnessed and brought under control with Webster Steam Heating Equipment, provides the heating comfort essential to all-out production.

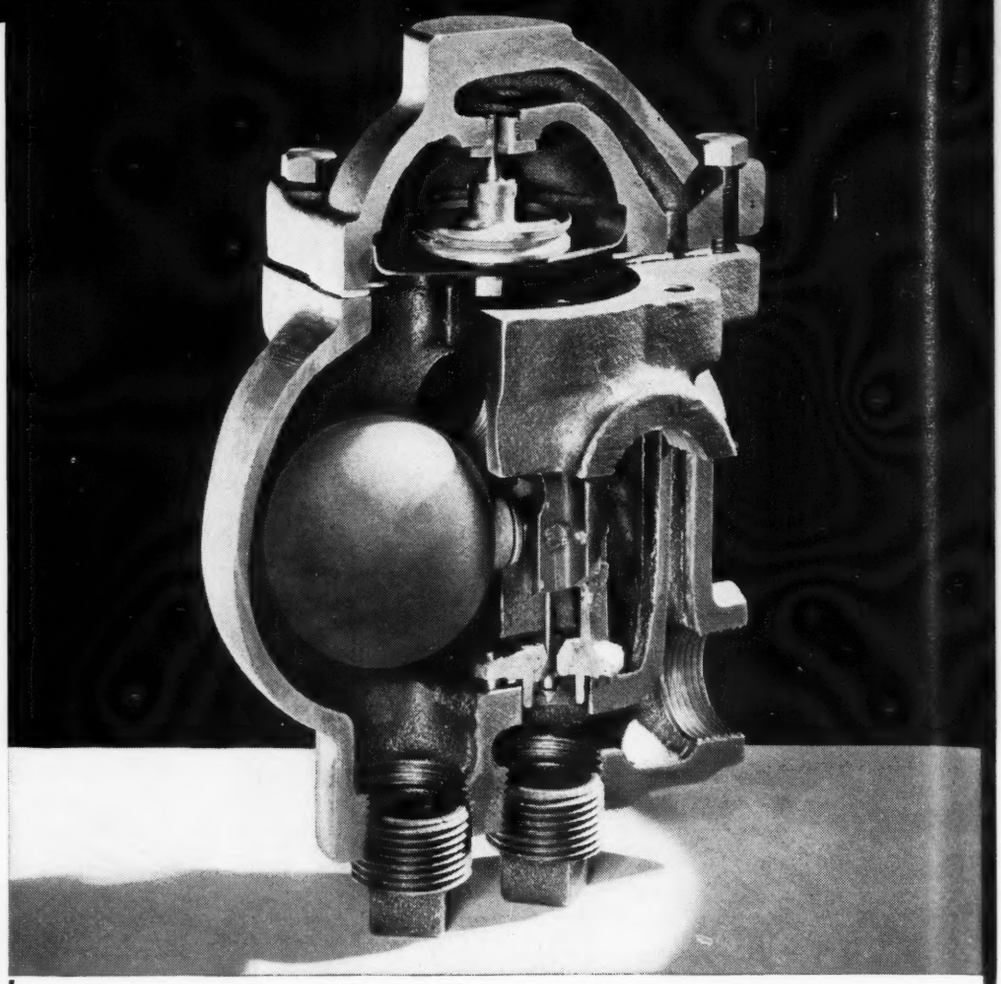
Today, we are engaged in direct war work, but manufacturing facilities are still available to supply Webster Steam Heating Equipment for plants serving the war effort.

Essential repairs for Webster Systems are available on A-10 priority, under W. P. B. Emergency Repair Order P-84. Orders should be limited to actual needs.

Warren Webster & Company, Camden, N. J.
Representatives in 60 principal Cities

Webster
Steam Heating

This is one of a series of advertisements that will tell the public of the part that Webster Steam Heating and the Webster organization plays in the war effort . . . appearing regularly in leading business, industrial, engineering and technical publications.



Webster Combination Float and Thermostatic Drip Trap

Check This Important Advantage

Continuous Draining

Webster Combination Float and Thermostatic Traps assure unimpaired steam circulation in low pressure heating systems . . . give top-notch results from process equipment. No water build-up in the piping. No water hammer which may loosen piping and cause leaks. The float-controlled *outward opening valve* stays open as long as there is water present. Generous thermostatic by-pass closes only when the trap body is finally filled with saturated steam. Excellent for starting up cold, when large volumes of condensation are involved. Air and non-condensible gases are discharged continuously into the return. Full-sized thermostatic air by-pass is fully compensated for operation at all pressures. Webster Series "26" Traps are for pressures up to 15 lbs. per square inch. Webster Series "79" Traps are for pressures up to 150 lbs. per square inch. Operation is quiet—working parts are not subject to shock or hammer during operation. Light cover is removable for repairing trap interior. Webster Float and Thermostatic Traps are ideal for Unit Heaters, too. Consult nearest Webster Representative for full details.

WEBSTER PRODUCTS AND SERVICES . . .

Process Steam Traps, Radiator Valves, Thermostatic Traps, Dirt Pockets, Dirt Strainers, Lift Fittings, Expansion Joints, Vacuum Governors, Unit Heaters, Boiler Protectors, Boiler Return Traps, Vent Traps, Vacuum and Vapor Systems of Steam Heating, Central Heat Controls, Heating Modernization Programs.

WARREN WEBSTER & COMPANY

CAMDEN, N. J., EST. 1888, PIONEERS OF VACUUM STEAM HEATING

Wheeling Steel Co, Wheeling, W. Va.
Youngstown Sheet & Tube Co, Youngstown, Ohio
Adv page 189

TUBES, CONDENSER

American Brass Co, Waterbury, Conn.
Bridgeport Brass Co, 30 Grand St, Bridgeport, Conn.
Chase Brass & Copper Co, 236 Grand St, Waterbury, Conn.
Foster Wheeler Corp, 165 Broadway, New York, N. Y.
Adv pages 38, 39
Globe Steel Tubes Co, 4051 W Burnham St, Milwaukee, Wis.
Adv page 151
Michigan Steel Tubes Products Co, 9540 Buffalo St, Detroit, Mich.
National Tube Co, PO Box 266, Pittsburgh, Pa.
Ohio Seamless Tube Co, Shelby, Ohio
Phelps Dodge Copper Products Corp, 40 Wall, New York, N. Y.
Revere Copper & Brass Co, 230 Park Ave, New York, N. Y.
Adv pages 20, 21
Scovill Mfg Co, 99 Mill St, Waterbury, Conn.
Adv page 111
Steel & Tubes Div, Republic Steel Corp, Cleveland, Ohio
Warren Foundry & Pipe Corp, 11 Broadway, New York, N. Y.
Wolverine Tube Co, Detroit, Mich.
York Ice Machy Corp, York, Pa.

TUBES, PITOT

American Blower Corp, 6000 Russell St, Detroit, Mich.
Bacharach Ind Instrument Co, 7000 Bennett St, Pittsburgh, Pa.
Adv page 289
Defender Automatic Regulator Co, St Louis, Mo.
Ellison Draft Gage Co, 214 W Kinzie St, Chicago, Ill.
Madden, P E, & Co, 352 W Walton St, Chicago, Ill.

TUBING, GLASS

Corning Glass Works, Dept IP, Corning, N. Y.
Fischer & Porter Co, 60 County Line Rd, Hatboro, Pa.
Swift Lubricator Co, 330 James Bldg, Elmira, N. Y.

TUBING, FLEXIBLE METAL

American Metal Hose Branch of American Brass Co, Waterbury, Conn.
Adv page 121
Atlantic Metal Hose Co, 107 W 64th St, New York, N. Y.
Chicago Metal Hose Corp, 1312 S 3rd Ave, Maywood, Ill.
Eclipse Aviation Corp, Wissahickon Ave, Philadelphia, Pa.
Federal Metal Hose Corp, 277 Military Rd, Buffalo, N. Y.
Mulconroy Co, 54th & Jefferson Sts, Philadelphia, Pa.
National Lead Co, 111 Broadway, New York, N. Y.
Pennsylvania Flexible Metallic Tubing Co, 7202 Powers Lane, Philadelphia, Pa.
Seamlex Co, 27-27 Jackson Ave, Long Island City, N. Y.
Titeflex Metal Hose Co, Frelinghuysen Ave, Newark, N. J
United Metal Hose Co, 3601 43rd Ave, Long Island City, N. Y.

TURBINES, HYDRAULIC

Allis-Chalmers Mfg Co, Milwaukee, Wis.
Adv page 6, 7
Baldwin-Southwark Div, Baldwin Locomotive Works, Paschall PO, Philadelphia, Pa.
De Laval Steam Turbine Co., Trenton, N. J.
Adv page 58
Holyoke Machine Co, Holyoke, Mass.
Hunt, Rodney, Machine Co, Orange, Mass.
Leffel, James, & Co, Springfield, Ohio
Newport News Shipbuilding and Dry Dock Co, Newport News, Va.
Pelton Water Wheel Co, San Francisco, Calif.
Smith, S Morgan, Co 500 Lincoln St, York, Pa.

TURBINE OILS

(See Oils, Lubricating)

TURBINES, STEAM, GENERATOR DRIVE

Allis-Chalmers Mfg Co, Milwaukee, Wis.
Adv pages 6, 7
De Laval Steam Turbine Co, Trenton, N. J.
Adv page 58
Elliott Co, Jeannette, Pa.
Adv pages 4, 5, 187
General Electric Co, Schenectady, N. Y.
Adv pages 32, 33
Moore Steam Turbine Div, 37 Coats St, Wellsville, N. Y.
Murray Iron Works Co, Burlington, Iowa
Adv page 148
Terry Steam Turbine Co, Box 1200, Hartford, Conn.
Adv page 54
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61

TURBINES, STEAM, MECHANICAL DRIVE

Allis-Chalmers Mfg Co, Milwaukee, Wis.
Adv pages 6, 7
Coppus Engineering Corp, 350 Park Ave, Worcester, Mass.
Dean Hill Pump Co, Anderson, Ind.
De Laval Steam Turbine Co, Trenton, N. J.
Adv page 58
Elliott Co, Jeannette, Pa.
Adv pages 4, 5, 187
General Electric Co, Schenectady, N. Y.
Adv pages 32, 33
Moore Steam Turbine Div, 37 Coats St, Wellsville, N. Y.
Murray Iron Works Co, Burlington, Iowa
Adv page 148
Terry Steam Turbine Co, Box 1200, Hartford, Conn.
Adv page 54
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61
Wing, L J. Mfg Co, W 14th St & 7th Ave, New York, N. Y.
Adv page 194

TURBOBLOWERS

Allen Billmyre Corp, Daily News Building, New York, N. Y.
Allis-Chalmers Mfg Co, Milwaukee, Wis.
Adv pages 6, 7
Carling Turbine Blower Co, 25 St John's Rd, Worcester, Mass.
Coppus Engrg Corp, 350 Park Ave, Worcester, Mass.
De Laval Steam Turbine Co, Trenton, N. J.
Adv page 58
Elliott Co, Jeannette, Pa.
Adv pages 4, 5, 187
Ingersoll-Rand Co, 11 Broadway, New York, N. Y.
Adv pages 168, 169
Natural Gas Equipment Inc, 539 Petroleum Bldg, Los Angeles, Calif.
Power Turbo-Blower Co, 30 Vesey St, New York, N. Y.
Roots-Connersville Blower Corp, Connersville, Ind.
Spencer Turbine Co, 488 New Park Ave, Hartford, Conn.
Sturtevant, B F, Co, 47 Readville St, Boston, Mass.
Adv pages 40, 41
Wing, L J Mfg Co, W 14th St & 7th Ave, New York, N. Y.
Adv page 194

UNDERGROUND STEAM CONDUIT

(See Conduit, Underground, Steam)

UNIONS

Bowser, S F, & Co, 1302 E Creighton Ave, Fort Wayne, Ind.
Clayton Mark & Co, 1900 Dempster St, Evanston, Ill.
Crane Co, 836 S Michigan Ave, Chicago, Ill.
Adv page 123
Dart, E M, Mfg Co, 134 Thurbers Ave, Providence, R. I.
Fairbanks Co, 397 Lafayette St, New York, N. Y.
Adv page 170
General Fittings Co, Providence, R. I.
Jarecki Mfg Co, Erie, Pa.
Jefferson Union Co, 601 W 26th St, New York, N. Y.
Kennedy Valve Mfg Co, Elmira, N. Y.
Adv page 191
Leahy Mfg Co, E 8th St, Los Angeles, Calif.
Lunkenheimer Co, Box 360, Annex Station, Cincinnati, O.
Adv pages 221, 240, 275, 276, 278, 279, 280
Malleable Iron Fittings Co, Branford, Conn.
Pittsburgh Valve & Fittings Corp, Barberton, Ohio
Rhode Island Fittings Co, Hillsgrove, R. I.

Look for the noun in the product listing, for example:
"Valves, Regulating"
not
"Regulating Valves"

Rhode Island Malleable Iron Works, Hillsgrove, R. I.
Rockwood Sprinkler Co, 54 Harlow St, Worcester, Mass.
United Superior Union Co, 29 Ryerson St, Brooklyn, N. Y.
Vogt, Henry, Machine Co, 1000 W Ormsby St, Louisville, Ky.
Adv page 46
Walworth Co, 60 E 42nd St, New York, N. Y.
Adv pages 168, 169

USED EQUIPMENT

(See Searchlight Section of this issue, page 292, and Classified Directory, page 258, December POWER)

VACUUM-CLEANING SYSTEMS

(See Cleaning Systems, Vacuum)

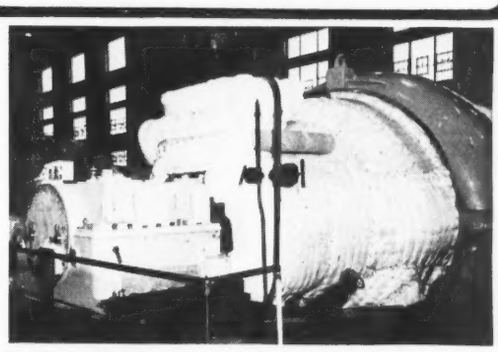
VALVE OPERATORS, HAND-CHAIN

Babbitt Steam Specialties Co, 55 S Water St, New Bedford, Mass.
Adv page 154
Crane Co, 836 S Michigan Ave Chicago, Ill.
Adv page 123
Vapor Car Heating Co, 80 East Jackson Boulevard, Chicago, Illinois.

VALVE OPERATORS, MOTOR

Barber Colman Co, Rockford, Ill.
Chapman Valve Mfg Co, Pinevale St, Indian Orchard, Mass.
Adv page 139
Crane Co, 836 S Michigan Ave, Chicago, Ill.
Adv page 123
Cutler-Hammer Inc, 315 N 12th St, Milwaukee, Wis.
Adv page 107
General Controls Co, 810 Allen Ave, Glendale, Calif.
General Electric Co, Schenectady, N. Y.
Adv pages 32, 33
Hagan Corp, Hagan Bldg, Pittsburgh, Pa.
Adv pages 30, 31
Jenkins Bros, 80 White St, New York, N. Y.
Minneapolis-Honeywell Regulator Co, 2747 4th Ave S, Minneapolis, Minn.
Philadelphia Gear Works, Erie Ave & G St, Phila., Pa.
Adv page 57

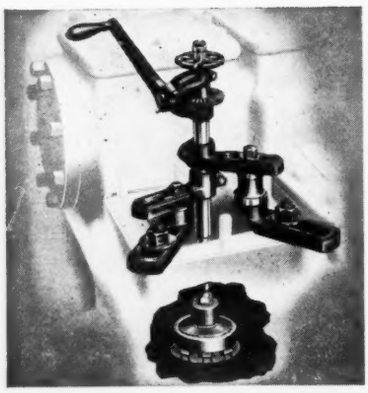
TURBINE BLANKETS



EASE of application . . . removal . . . and re-application, cleanliness, durability, and low thermal conductivity are features that have made UNARCO enclosed pad type Turbine Blankets outstanding favorites with engineers all over the country. Glass-fabric pad with glass-wool filler, as well as asbestos blankets, now available for high temperature service. Easy to order—we work with all principal turbine builders. Quotations on request.

UNARCO
UNION ASBESTOS & RUBBER CO.
1811 S. 54th Ave., Cicero, Illinois
CHICAGO—310 S. Michigan Ave. NEW YORK—420 Lexington Ave.
SAN FRANCISCO—116 New Montgomery St.
Contractor-Distributors Located in Principal Industrial Centers

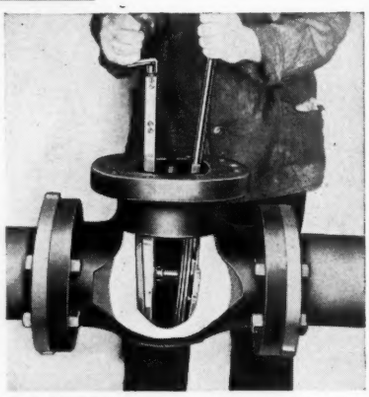
DEXTER
VALVE RESEATING EQUIPMENT
. . . for reconditioning
GATE, GLOBE *and* PUMP VALVES



VALVES SEATED IN POSITION
•
MAKES VALVES LAST LONGER
•
PAYS FOR ITSELF

Dexter Pump Valve Reseating Machine, reseating suction valves in triplex pump.

Dexter Pump Valve Reseating Machines are made in capacities from 1½" to 15", for reseating both suction and discharge valve seats. Reseating is accomplished without removing the valve, quickly and easily, making valves absolutely tight to assure the maximum in pump duty. All types of pump valves can be reseated with Dexter Equipment.



Reseating Gate Valve with Dexter Equipment.

Dexter Globe Valve Reseating Machine

Dexter Gate Valve Reseating Machines are made in capacities from 1½" to 48". These machines are self-aligning and maintain correct angle of both seat and disc. Tight closing of reseated valve is assured.

•

Dexter Globe Valve Machines — in capacities from ¼" to 14"—can be used for reseating all types of globe valves and do a perfect pressure tight job without removing valve from line. In time saving alone Dexter Globe Valve Equipment will pay for itself.

Write for Catalog 40 giving complete details of DEXTER VALVE RESEATING MACHINES.

ALSO Swendeman Automatic SEPARATORS For Compressed Air

The LEAVITT MACHINE CO.
ORANGE, MASS.

VALVE-RESEATING MACHINES

Black & Decker Mfg Co, Towson, Md.
Carlan Tool Co, 1925 Galloping Hill Rd, Elizabeth, N. J.
Leavitt Machine Co, 8 E River St, Orange, Mass.
Adv pages 237, 251
Sexauer, J A, Mfg Co, 2503 Third Avenue, New York, N.Y.

VALVES, BALANCED

Atlas Valve Co, 289 South St, Newark, N. J.
Adv page 281
Atwood & Morrill Co, Salem, Mass.
Bailey Meter Co, 1036 Ivanhoe Rd, Cleveland, Ohio
Adv pages 14, 15
Belfield, H, Co, 435 N Broad St, Phila, Pa.
Cash, A W, Co, 402 N Eldorado St, Decatur, Ill.
Davis Regulator Co, 2540 Washtenaw Ave, Chicago, Ill.
Defender Automatic Regulator Co, St Louis, Mo.
Edison, Thomas A, Inc, West Orange, N. J.
Fisher Governor Co, 203 S 1st Ave, Marshalltown, Iowa
Foster Engrg Co, 109 Monroe St, Newark, N. J.
Adv pages 230, 257, 259, 276
Golden-Anderson Valve Specialty Co, 1315 Fulton Bldg, Pittsburgh, Pa.
Adv page 140
Hagan Corp, Hagan Bldg, Pittsburgh, Pa.
Adv pages 30, 31
Illinois Engrg Co, Racine Ave & 21st St, Chicago, Ill.
Keckley, O C, Co, 400 W Madison St, Chicago, Ill.
Kennedy Valve Mfg Co, Elmira, N. Y.
Adv page 191
Kieley & Mueller, Inc, 2015-2033 43rd St, No Bergen, N. J.
Klipfel Mfg Co, 2651 W Harrison St, Chicago, Ill.
Lewis Steam Specialty & Valve Co, 247 E Ashmead St, Philadelphia, Pa.
McAlear Mfg Co, Chicago, Ill.
Mason-Neilan Regulator Co, 1186 Adams St, Boston, Mass.
Mueller Co, Decatur, Ill.
Natural Gas Equipment Inc, 539 Petroleum Bldg, Los Angeles, Calif.
Northern Equipment Co, 1221 Grove Drive, Erie, Pa.
Adv page 119
Oilgear Co, 1421 W Bruce St, Milwaukee, Wis.
Philadelphia Valve Co, Aramingo Ave, Philadelphia, Pa.
Reading-Pratt & Cady Div, Reading, Pa.
Adv pages 176, 177
Republic Flow Meters Co, 2222 Diversey Pkwy, Chicago, Ill.
Adv pages 215, 221, 241, 280
Ruggles-Klingemann Mfg Co, Salem, Mass.
Schade Valve Mfg Co, 2527 N Bodine St, Philadelphia, Pa.
Schutte & Koerting Co, 12th & Thompson Sts, Phila, Pa.
Swartwout Co, 18511 Euclid Ave, Cleveland, Ohio
Adv page 312
Waters Governor Co, 1123 Oliver Bldg, Boston, Mass.
Watson-Stillman Co, Roselle, N. J.
Adv page 226
Watts Regulator Co, Lawrence, Mass.
Adv page 207

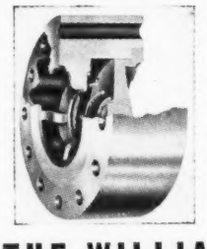
VALVES, BLOW-OFF

Belfield, H, Co, 435 N Broad St, Phila, Pa.
Bordo, L J, Co, Glenside, Pa.
Cochrane Corp, 3106 N 17th St, Philadelphia, Pa.
Adv pages 154, 233, 240, 261, 269
Crane Co, 836 S Michigan Ave, Chicago, Ill.
Adv page 123
Edward Valve & Mfg Co, 1150 W 145th St, East Chicago, Ind.
Adv page 277
Elliott Co, Jeannette, Pa.
Adv pages 4, 5, 187
Everlasting Valve Co, 53 Fisk St, Jersey City, N. J.
Adv page 158
Fairbanks Co, 397 Lafayette St, New York, N. Y.
Adv page 170
Hancock Valve Div, 143 Elias St, Bridgeport, Conn.
Homestead Valve Mfg Co, Box 210, Coraopolis, Pa.
Jarecki Mfg Co, Erie, Pa.
Jenkins Bros, 80 White St, New York, N. Y.
Keckley, O C, Co, 400 W Madison St, Chicago, Ill.
Ludlow Valve Mfg Co, Foot of Adams St, Troy, N. Y.
Lunkenheimer Co, Box 360, Annex Station, Cincinnati, Ohio
Adv pages 221, 240, 275, 276, 278, 279, 280
McDonnell & Miller, Wrigley Bldg, Chicago, Ill.
Madden, P E, & Co, 352 W Walton St, Chicago, Ill.
Ohio Injector Co, 150 Ohio Ave, Wadsworth, Ohio
Powell, Wm, Co, Cincinnati, O.
Adv pages 166, 168
Strong, Carlisle & Hammond Co, 1392 W 3rd St, Cleveland, O.
Adv page 285
Walworth Co, Inc, 60 E 42nd St, New York, N. Y.
Adv pages 172, 173
Watson-Stillman Co, Roselle, N. J.
Adv page 226
Williams, D T, Valve Co, 2854 Spring Grove, Cincinnati, O.
Yarnall-Waring Co, Chestnut Hill, Philadelphia, Pa.
Adv pages 109, 239, 244, 275, 283

VALVES, CHECK

Barrett, Haentjens & Co, Hazleton, Pa.
Bastian-Blessing Co, 4201 Peterson Ave, Chicago, Ill.
Belfield, H, Co, 435 N Broad St, Phila, Pa.
Bowser, S F, & Co, 1302 E Creighton, Fort Wayne, Ind.
Chapman Valve Mfg Co, Pinevale St, Indian Orchard, Mass.
Adv page 139

WILLIAMS-HAGER
FLANGED SILENT CHECK VALVES



Important and efficient improvement in check valves. Side-guided, free-floating valve, operates in any position—horizontal, vertical or upside down.

Positively silent in operation—corrects water-hammer. Durability insured by proper design—Sizes 1" to 20" inclusive.

Producers — Pump Governors — Pump Valves — Safety Water Columns — Water Gauges — Gauge Cocks, Feed Water Regulators and Steam Traps.

THE WILLIAMS GAUGE COMPANY
1820 Pennsylvania Avenue N. S. Pittsburgh, Pa.

LUNKENHEIMER

125 lb. S. P.
BRONZE GATE VALVES

Double Disc and Wedge Disc Patterns

Descriptive Circular On Request

Lunkenheimer Distributors
In All Industrial Centers

ESTABLISHED 1862
THE LUNKENHEIMER CO.
"QUALITY"
CINCINNATI, OHIO, U. S. A.

Clayton Mark & Co, 1900 Dempster St, Evanston, Ill.
Cochrane Corp, 3106 N 17th St, Philadelphia, Pa.
Adv pages 154, 233, 240, 261, 269
Crane Co, 836 S Michigan Ave, Chicago, Ill.
Adv page 123
Darling Valve & Mfg Co, Williamsport, Pa.
Adv page 27
Davis Regulator Co, 2540 S Washtenaw Ave, Chicago, Ill.
Duriron Co, Inc, Dayton, Ohio
Edward Valve & Mfg Co, 1150 W 145th St, East Chicago, Ind.
Adv page 277
Fairbanks Co, 397 Lafayette St, New York, N. Y.
Adv page 170
Foster Engrg Co, 109 Monroe St, Newark, N. J.
Adv pages 230, 257, 259, 276
Golden - Anderson Valve Specialty Co, 1315 Fulton Bldg, Pittsburgh, Pa.
Adv page 140
Hancock Valve Div, 143 Elias St, Bridgeport, Conn.
Jarecki Mfg Co, Erie, Pa.
Jenkins Bros, 80 White St, New York, N. Y.
Kennedy Valve Mfg Co, Elmira, N. Y.
Adv page 191
Kieley & Mueller Co, 2015-2033 43rd St, No Bergen, N. J.
Ludlow Valve Mfg Co, Ft of Adams St, Troy, N. Y.
Lunkenheimer Co, Box 360, Annex Station, Cincinnati, O.
Adv pages 221, 240, 275, 276, 278, 279, 280
McNally Pittsburg Mfg Co, Pittsburg, Kansas
M & H Valve & Fittings Co, Anniston, Ala.
Milwaukee Valve Co, Milwaukee, Wis.
Mueller Co, Decatur, Ill.
Norgren, C A, Co, 210 Santa Fe Drive, Denver, Colo.
Ohio Brass Co, Mansfield, Ohio
Ohio Injector Co, 150 Ohio Ave, Wadsworth, Ohio
Ostlind Valve Co, 2313 N E Union, Portland, Ore.
Parker Appliance Co, 17325 Euclid Ave, Cleveland, Ohio
Pittsburgh Valve & Fittings Corp, Barberton, Ohio
Plouff Co, 1150 Columbus Ave, Boston, Mass.
Powell, Wm, Co, Cincinnati, O.
Adv pages 166, 167
Reading-Pratt & Cady Div, Reading, Pa.
Adv pages 176, 177
Ruggles-Klingemann Mfg Co, Salem, Mass.
Schutte & Koerting Co, 12th & Thompson Sts, Phila, Pa.
Star Brass Mfg Co, 110 E Dedham St, Boston, Mass.
Stockham Pipe Fittings Co, Birmingham, Ala.
Strong, Carlisle & Hammond Co, 1392 W 3rd St, Cleveland, O.
Adv page 285
Vogt, Henry, Machine Co, 1000 W Ormsby St, Louisville, Ky.
Adv page 46
Walworth Co, 60 E 42nd St, New York, N. Y.
Adv pages 172, 173
Watson-Stillman Co, Roselle, N. J.
Adv page 226
Williams Gauge Co, 1938 Penna. Ave, N S, Pittsburgh, Pa.
Adv page 274
Williams, D T, Valve Co, 2854 Spring Grove, Cincinnati, O.

VALVES, COMPRESSED-AIR

Bastian-Blessing Co, 4201 Peterson Ave, Chicago, Ill.
Bell Machine Co, Oshkosh, Wis.
Cash, A W, Co, 402 N Eldorado St, Decatur, Ill.
Crane Co, 836 S Michigan Ave, Chicago, Ill.
Adv page 123
Curtis Pneumatic Machinery Co, 1934 Kien Ave, St Louis, Mo.
Edward Valve & Mfg Co, 1150 W 145th St, East Chicago, Ind.
Adv page 277
Foster Engineering Co, 109 Monroe St, Newark, N. J.
Adv pages 230, 257, 259, 276

LUNKENHEIMER

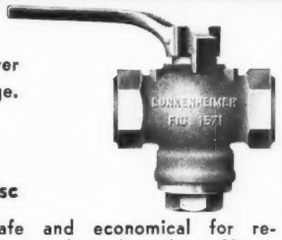
AIR COCK

Will pay for itself many times over in prevention of costly air leakage.

• • •

AIR NOZZLES

Regrinding or Non-Metallic Disc

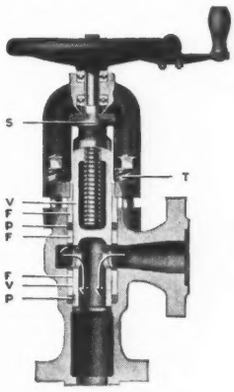


Safe and economical for removing dust, dirt, chips, filings.

ESTABLISHED 1862
THE LUNKENHEIMER CO.
"QUALITY"
CINCINNATI, OHIO, U. S. A.

YARWAY BLOW-OFF VALVES

Used singly or in tandem in more than 12,000 plants in 67 different industries. Recommended by leading steam plant designers and builders of steam generating equipment.



Seatless Type

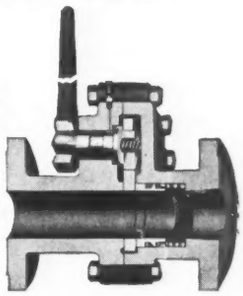
Made in several styles for working pressures up to 1500 lbs. Sizes 1" to 2½". Angle and straightway.

OPERATION: After valve has been closed, shoulder S on plunger V contacts upper follower gland F, forcing it down into body and compressing packing P above and below port, making an absolutely tight valve. Yoke tension springs T maintain continuous compression on packing train. Alemite lubrication of plunger and stem.

Send for celluloid working model and Bulletins B-421 and B-430

Double-Tightening Type

Lever-operated, swing gate design with unique feature of sealing bushing on inlet side, making it double-tightening on both sides of gate. When open provides straight through passage for unobstructed flow. Alemite lubrication of stem and disc. Made in several styles for pressures to 300 lbs. Sizes 1" to 2½". Write for Bulletin B-421.



Tandems

Fig. 1, Yarway Seatless and Double-Tightening Tandem for pressures of 200 to 300 lbs.

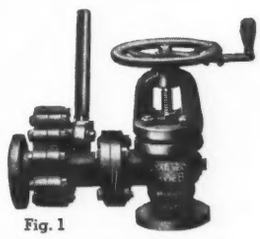


Fig. 1

Fig. 2, Yarway Seatless Type C Tandem for 400 to 600 lbs. pressure. Sizes 1" to 2½".

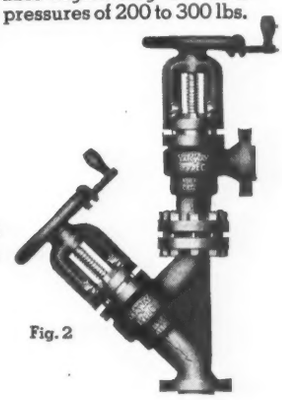


Fig. 2

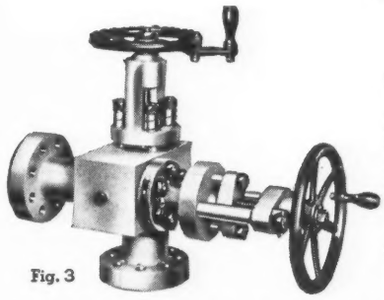


Fig. 3

Fig. 3, Yarway Unit Tandem Valve in which hard seat valve and seatless valve are mounted together in one-piece forged steel body. Sizes 1" to 2", pressures 600 to 2,500 lbs.

Write for Bulletins B-422 and B-431.

See other Yarway Advertisements on pages 109, 239, 244, 283

YARNALL-WARING COMPANY
100 MERMAID AVE., PHILA.

Hills-McCanna Co, 3025 N Western Ave, Chicago, Ill.
Homestead Valve Mfg Co, Box 210, Coraopolis, Pa.
Jenkins Bros, 80 White St, New York, N. Y.
Johnson Service Co, 507 E Michigan St, Milwaukee, Wis.
Limbert, Geo B, & Co, 570 Fulton St, Chicago, Ill.
Lunkenheimer Co, Box 360, Annex Station, Cincinnati, Ohio
Adv pages 221, 240, 275, 276, 278, 279, 280
Norgren, C A, Co, 210 Santa Fe Drive, Denver, Colo.
Plouff Co, 1150 Columbus Ave, Boston, Mass.
Powell, Wm, Co, Cincinnati, O.
Adv pages 166, 167
Vogt, Henry, Machine Co, 1000 W Ormsby St, Louisville, Ky.
Adv page 46

VALVES, DIAPHRAGM

Atlas Valve Co, 289 South St, Newark, N. J.
Adv page 281
Bastian-Blessing Co, 4201 Peterson Ave, Chicago, Ill.
Belfield, H, Co, 435 N Broad St, Philadelphia, Pa.
Bristol Co, Waterbury, Conn.
Cash, A W, Co, 402 N Eldorado St, Decatur, Ill.
Crane Co, 836 S Michigan Ave, Chicago, Ill.
Adv page 123
Davis Regulator Co, 2540 S Washtenaw Ave, Chicago, Ill.
Fisher Governor Co, 203 S 1st Ave, Marshalltown, Iowa
Foster Engrg Co, 109 Monroe St, Newark, N. J.
Adv pages 230, 257, 259, 276
General Controls Co, 810 Allen Ave, Glendale, Calif.
Golden-Anderson Valve Specialty Co, 1315 Fulton Bldg, Pittsburgh, Pa.
Adv page 140
Grove Regulator Co, 1190 67th St, Oakland, Calif.
Hancock Valve Div, 143 Elias St, Bridgeport, Conn.

LUNKENHEIMER

STEEL VALVES
150 - 1500 lb. S. P.
Gate, Globe, Check, Non-return, Blow-off, in a variety of trim and body materials.
For flanged or welded piping and with motor control or gearing.
Lunkenheimer Distributors In All Industrial Centers
ESTABLISHED 1862
THE LUNKENHEIMER CO.
"QUALITY"
CINCINNATI, OHIO, U.S.A.

LUNKENHEIMER

GATE VALVES
I.B.B.M. and All-Iron
125 - 250 lb. S. P.
Unique method of disc guiding insures positive seating.
Descriptive Circular On Request
Lunkenheimer Distributors In All Industrial Centers
ESTABLISHED 1862
THE LUNKENHEIMER CO.
"QUALITY"
CINCINNATI, OHIO, U.S.A.

Hills-McCanna Co, 3025 N Western Ave, Chicago, Ill.
Illinois Engrg Co, Racine Ave & 21st St, Chicago, Ill.
Johnson Service Co, 509 E Michigan St, Milwaukee, Wis.
Kieley & Mueller, Inc, 2015-2033 43rd St, No Bergen, N. J.
Klipfel Mfg Co, 2651 W Harrison St, Chicago, Ill.
Kunkle Valve Co, Fort Wayne, Ind.
Lonergan, J E, Co, 211 Race St, Philadelphia, Pa.
Adv page 281
McAlear Mfg Co, Chicago, Ill.
Mason - Neilan Regulator Co, 1186 Adams St, Boston, Mass.
Milwaukee Valve Co, Milwaukee, Wis.
Minneapolis - Honeywell Regulator Co, 4490 Wayne Ave, Phila, Pa.
Mueller Co, Decatur, Ill.
Mueller Brass Co, 1925A Lapeer Ave, Port Huron, Mich.
Pfaudler Co, Rochester, N. Y.
Plouff Co, 1150 Columbus Ave, Boston, Mass.
Powers Regulator Co, 2771-2 Greenview Ave, Chicago, Ill.
R-S Products Corp, 4530 Germantown Ave, Philadelphia, Pa.
Ruggles-Klingemann Mfg Co, Salem, Mass.
Schade Valve Mfg Co, 2527 N Bodine St, Philadelphia, Pa.
Schutte & Koerting Co, 12th & Thompson Sts, Phila, Pa.
Spence Engrg Co, Inc, 61 Grant St, Walden, N. Y.
Taylor Instrument Cos, Rochester, N. Y.
Watson & McDaniel Co, 441 N Marshall St, Phila, Pa.

VALVES, FLOAT

Alco Valve Co, St. Louis, Mo.
Atlas Valve Co, 289 South St, Newark, N. J.
Adv page 281
Atwood & Morrill Co, Salem, Mass.
Belfield, H, Co, 435 N Broad St, Phila, Pa.
Cash, A W, Co, 402 N Eldorado St, Decatur, Ill.
Cochrane Corp, 3106 N 17th St, Philadelphia, Pa.
Adv pages 154, 233, 240, 261, 269
Crane Co, 836 S Michigan Ave, Chicago, Ill.
Adv page 123
Darling Valve & Mfg Co, Williamsport, Pa.
Adv page 27
Davis Regulator Co, 2540 Washtenaw Ave, Chicago, Ill.
Defender Automatic Regulator Co, St Louis, Mo.
Fisher Governor Co, 203 S 1st Ave, Marshalltown, Iowa
Foster Engrg Co, 109 Monroe St, Newark, N. J.
Adv pages 230, 257, 259, 276
Golden-Anderson Valve Specialty Co, 1315 Fulton Bldg, Pittsburgh, Pa.
Adv page 140
Hancock Valve Div, 143 Elias St, Bridgeport, Conn.
Illinois Engrg Co, Racine Ave & 21st St, Chicago, Ill.
Keckley, O C, Co, 400 W Madison St, Chicago, Ill.
Kieley & Mueller Inc, 2015-2033 43rd St, No Bergen, N. J.
Klipfel Mfg Co, 2651 W Harrison St, Chicago, Ill.
Ludlow Valve Mfg Co, Ft of Adams St, Troy, N. Y.
McAlear Mfg Co, Chicago, Ill.
McDonnell & Miller, Wrigley Bldg, Chicago, Ill.
Mason - Neilan Regulator Co, 1186 Adams St, Boston, Mass.
Milwaukee Valve Co, Milwaukee, Wis.
Mueller Co, Decatur, Ill.
Northern Equipment Co, 1221 Grove Drive, Erie, Pa.
Adv page 119
Plouff Co, 1150 Columbus Ave, Boston, Mass.
Reading-Pratt & Cady Div, Reading, Pa.
Adv pages 176, 177
R-S Products Corp, 4530 Germantown Ave, Philadelphia, Pa.
Ruggles-Klingemann Mfg Co, Salem, Mass.
Schade Valve Mfg Co, 2527 N Bodine St, Philadelphia, Pa.
Schaub, Fred H, Engrg Co, 325 W Huron St, Chicago, Ill.
Schutte & Koerting Co, 12th & Thompson Sts, Phila, Pa.
Spence Engrg Co, Inc, 61 Grant St, Walden, N. Y.
Waters Governor Co, 1123 Oliver Bldg, Boston, Mass.
Watts Regulator Co, Lawrence, Mass.

VALVES, FLUSHING

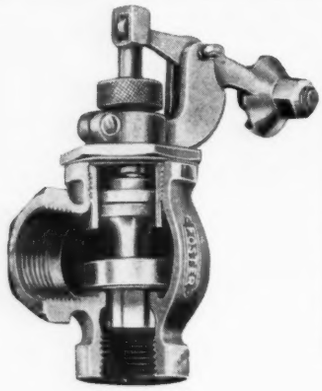
Crane Co, 836 S Michigan Ave, Chicago, Ill.
Adv page 123
Darling Valve & Mfg Co, Williamsport, Pa.
Adv page 27
Imperial Brass Mfg Co, 564 S Racine Ave, Chicago, Ill.
Sloan Valve Co, 4300 W Lake St, Chicago, Ill.

VALVES, FORGED-STEEL

Bacharach Industrial Instrument Co, 7000 Bennett St, Pittsburgh, Pa.
Adv page 289
Crane Co, 836 S Michigan Ave, Chicago, Ill.
Adv page 123
Darling Valve & Mfg Co, Williamsport, Pa.
Adv page 27
Jerguson Gage & Valve Co, Somerville, Mass.
Manning, Maxwell & Moore, Bridgeport, Conn.
R-S Products Corp, 4530 Germantown Ave, Philadelphia, Pa.
Strong, Carlisle & Hammond Co, 1392 W Third St, Cleveland, Ohio
Adv page 285
Vogt, Henry, Machine Co, 1000 W Ormsby St, Louisville, Ky.
Adv page 46
Walworth Co, 60 E 42nd St, New York, N. Y.
Adv pages 172, 173

VALVES, GATE

Bordo, L J, Co, Glenside, Pa.



Type 35-F"

FOSTER FLOAT VALVES

Here is a design (illustrated) of auxiliary-operated float valve that will not leak on any working pressure from 10 to 200 lbs. and can be used for water of any temperature up to 212°F. On temperatures above 160°, solid piston is provided in place of cup leather construction shown. The Foster Auxiliary-operated Float Valve is quick, positive and sensitive in operation, as it is actuated primarily by the pressure in the supply line, and because of this, large cumbersome floats are not required. The specially constructed tied-in type, the Foster Type 35-F2, combines this auxiliary-operated feature with direct action. Can be installed for operation in closed tanks. All types built with either angle or globe bodies.

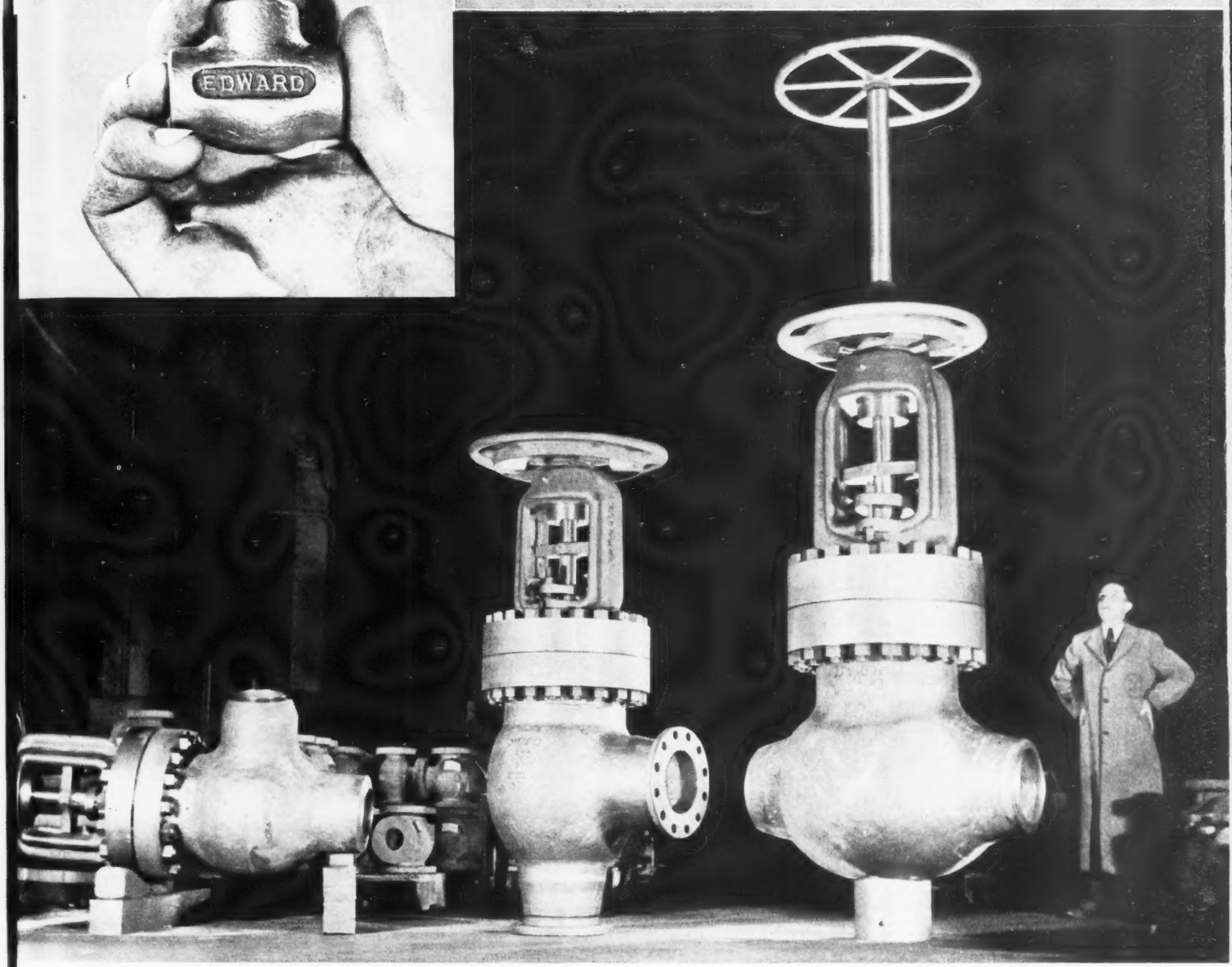
Type	Service	Working Pressures, Lbs. per Sq. In. Min.	Working Pressures, Lbs. per Sq. In. Max.	Maximum Temperature, Deg. Fahr.	Operation	Sizes, In.	Connections
34-F	For dead-end service where minimum inlet pressure is not less than 10 lbs. per sq. in.	10	200	212	Auxiliary-operated	½-4 1-8	Screwed Flanged
34-F1	For continuous flow service	0	40	212	Direct acting	½-6 1-8	Screwed Flanged
35-F2	For dead-end service and where inlet pressure may drop below 10 lbs. per sq. in.	0	200	212	Combined Auxiliary-operated and Tied-in Type	½-6 1-8	Screwed Flanged

A new complete catalog will be sent to executives and engineers engaged in those industries serving national defense if the request is written on their company's letterhead.

FOSTER ENGINEERING COMPANY
106 MONROE STREET NEWARK, N. J.
Manufacturers of a Complete Line of Automatic Valves
12-FE-1

"BABY" OR "GIANT"

EDWARD *PLUS VALUE* VALVES MEAN MINIMUM MAINTENANCE



THE EDWARD VALVE & MFG. CO., INC.

EAST CHICAGO INDIANA

BIG or little, Edward valves are built to stay on the job — without constant attention. Today, when time is so precious and operating interruptions so costly, Edward dependability is more important than ever. All Edward valves have one thing in common — basic fitness for tough service. The tiny ⅛ in. forged steel gage valve for many services (upper left) and the gigantic 10 in., 12 in., and 14 in. alloy steel valves for 1500 lb, 950 F service are built to equally exacting specifications. Sound design, careful selection of performance-proved materials, painstaking workmanship and rigid inspection at every stage of the manufacturing process — these are the principles behind Edward's tradition of "plus value" valves.

EDWARD *Steel* VALVES

CAST AND FORGED

Chapman Valve Mfg Co, Pinevale St, Indian Orchard, Mass.
Adv page 139
Crane Co, 836 S Michigan Ave, Chicago, Ill.
Adv page 123
Darling Valve & Mfg Co, Williamsport, Pa.
Adv page 27
Detroit Lubricator Co, 5900 Trumbull Ave, Detroit, Mich.
Duriron Co Inc, Dayton, Ohio
Everlasting Valve Co, 53 Fisk St, Jersey City, N. J.
Adv page 158
Fairbanks Co, 397 Lafayette St, New York, N. Y.
Adv page 170
Hancock Valve Div, 143 Elias St, Bridgeport, Conn.
Hunt, Rodney, Machine Co, Orange, Mass.
Jarecki Mfg Co, Erie, Pa.
Jenkins Bros, 80 White St, New York, N. Y.
Kennedy Valve Mfg Co, Elmira, N. Y.
Adv page 191
Koppers Co, Pittsburgh, Pa.
Ludlow Valve Mfg Co, Ft of Adams St, Troy, N. Y.
Lunkenheimer Co, Box 360, Annex Station, Cincinnati, Ohio
Adv pages 221, 240, 275, 276, 278, 279, 280
McNally Pittsburg Mfg Co, Pittsburg, Kansas
M & H Valve & Fittings Co, Anniston, Ala.
Milwaukee Valve Co, Milwaukee, Wis.
Morrison Bros Co, Dubuque, Iowa
Mueller Co, Decatur, Ill.
Ohio Brass Co, Mansfield, Ohio
Ohio Injector Co, 150 Ohio Ave, Wadsworth, Ohio
Pittsburgh Valve & Fittings Corp, Barberton, Ohio
Plouff Co, 1150 Columbus Ave, Boston, Mass.
Powell, Wm, Co, Cincinnati, O.
Adv pages 166, 167
Reading-Pratt & Cady Div, Reading, Pa.
Adv pages 176, 177
Reed Valve Div, PO Box 2119, Houston, Texas
Schutte & Koerting Co, 12th & Thompson Sts, Phila, Pa.
Stockham Pipe Fittings Co, Birmingham, Ala.
Strong, Carlisle & Hammond Co, 1392 W 3rd St, Cleveland, Ohio
Adv page 285
Vogt, Henry, Machine Co, 1000 W Ormsby St, Louisville, Ky.
Adv page 46
Walworth Co, Inc., 60 E. 42nd St, New York, N. Y.
Adv pages 172, 173
Williams, D T, Valve Co, 2854 Spring Grove Ave, Cincinnati, O.

VALVES, GLOBE

Belfield, H, Co, 435 N Broad St, Phila, Pa.
Chapman Valve Mfg Co, Pinevale St, Indian Orchard, Mass.
Adv page 139
Crane Co, 836 S Michigan Ave, Chicago, Ill.
Adv page 123
Edward Valve & Mfg Co, 1150 W 145th St, East Chicago, Ind.
Adv page 277
Fairbanks Co, 397 Lafayette St, New York, N. Y.
Adv page 170
Hancock Valve Div, 143 Elias St, Bridgeport, Conn.
Jarecki Mfg Co, Erie, Pa.
Jenkins Bros, 80 White St, New York, N. Y.
Kennedy Valve Mfg Co, Elmira, N. Y.
Adv page 191
Klingerit, Inc, 16 Hudson St, New York, N. Y.
Adv page 279
Ludlow Valve Mfg Co, Ft of Adams St, Troy, N. Y.
Lunkenheimer Co, Box 360, Annex Station, Cincinnati, O.
Adv pages 221, 240, 275, 276, 278, 279, 280
McNally Pittsburg Mfg Co, Pittsburg, Kansas
Milwaukee Valve Co, Milwaukee, Wis.
Minneapolis-Honeywell Regulator Co, 2747 4th Ave S, Minneapolis, Minn.
Ohio Brass Co, Mansfield, Ohio
Ohio Injector Company, 150 Ohio Ave, Wadsworth, Ohio
Parker Appliance Co, 17325 Euclid Ave, Cleveland, Ohio
Pittsburgh Valve & Fittings Corp, Barberton, Ohio
Plouff Co, 1150 Columbus Ave, Boston, Mass.
Powell, Wm, Co, Cincinnati, O.
Adv pages 166, 167
Reading-Pratt & Cady Div, Reading, Pa.
Adv pages 176, 177
Schutte & Koerting Co, 12th & Thompson Sts, Phila, Pa.
Star Brass Mfg Co, 110 E Dedham St, Boston, Mass.
Strong, Carlisle & Hammond Co, 1392 W 3rd St, Cleveland, O.
Adv page 285
Vogt, Henry, Machine Co, 1000 W Ormsby St, Louisville, Ky.
Adv page 46
Walworth Co, Inc, 60 E 42nd St, New York, N. Y.
Adv pages 172, 173
Watson-Stillman Co, Roselle, N. J.
Adv page 226
Williams, D T, Valve Co, 2854 Spring Grove Ave, Cincinnati

VALVES, INDICATOR

Bacharach Industrial Instrument Co, 7000 Bennett St, Pittsburgh, Pa.
Adv page 289
Crane Co, 836 S Michigan Ave, Chicago, Ill.
Adv page 123
Darling Valve & Mfg Co, Williamsport, Pa.
Adv page 27
Hagan Corp, Hagan Bldg, Pittsburgh, Pa.
Adv pages 30, 31
Homestead Valve Mfg Co, PO Box 210 Coraopolis, Pa.
Adv page 197
Jenkins Bros., 80 White St., New York, N. Y.
Kennedy Valve Mfg Co, Elmira, N. Y.
Adv page 191
Ludlow Valve Mfg Co, Ft of Adams St, Troy, N. Y.
Madden, P E, & Co, 352 W Walton St, Chicago, Ill.
Parker Appliance Co, 17325 Euclid Ave, Cleveland, Ohio
Tejax Engineering Corp, 2 Allens Ave, Providence, R. I.
Adv page 237
Walworth Co, 60 E 42nd St, New York, N. Y.
Adv pages 172, 173

VALVES, MIXING, GAS ENGINE

Atlas Valve Co, 289 South St, Newark, N. J.
Crane Co, 836 S Michigan Ave, Chicago, Ill.
Adv page 123
Eclipse Fuel Engrg Co, 707 S Main St, Rockford, Ill.
Sarco Co, 475 5th Ave, New York, N. Y.

VALVES, MIXING STEAM, WATER

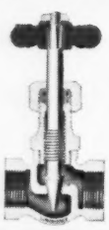
Crane Co, 836 S Michigan Ave, Chicago, Ill.
Adv page 123
Edison, Thomas A, Inc, West Orange, N. J.
Johnson Service Co, 507 E Michigan St, Milwaukee, Wis.
Powers Regulator Co, 2771-2 Greenview Ave, Chicago, Ill.
Sterling Inc, Milwaukee, Wis.
Taylor Instrument Cos, 95 Ames St, Rochester, N. Y.
Vapor Car Heating Co, 80 East Jackson Blvd, Chicago, Ill.

VALVES, MOTOR-OPERATED

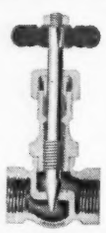
Automatic Temperature Control Co, Germantown Ave & Logan St, Philadelphia, Pa.
Barber Colman Co, Rockford, Ill.
Chapman Valve Mfg Co, Pinevale St, Indian Orchard, Mass.
Adv page 139
Crane Co, 836 S Michigan Ave, Chicago, Ill.
Adv page 123
Cutler-Hammer, Inc, 315 N 12th St, Milwaukee, Wis.
Adv page 107
Darling Valve & Mfg Co, Williamsport, Pa.
Adv page 27
Davis Regulator Co, 2540 S Washtenaw Ave, Chicago, Ill.
Edward Valve & Mfg Co, 1150 W 145th St, East Chicago, Ind.
Adv page 277
Everlasting Valve Co, 53 Fisk St, Jersey City, N. J.
Adv page 158
Foster Engineering Co, 109 Monroe St, Newark, N. J.
Adv pages 230, 257, 259, 276
Foxboro Co, 38 Neponset Ave, Foxboro, Mass.
General Controls Co, 810 Allen Ave, Glendale, Calif.
General Electric Co, Schenectady, N. Y.
Adv pages 32, 33
Heacon Inc, Luzerne & 2nd Sts, Philadelphia, Pa.
Hills-McCanna Co, 3025 N Western Ave, Chicago, Ill.
Homestead Valve Mfg Co, PO Box 210, Coraopolis, Pa.
Adv page 197
Illinois Engineering Co, Racine Ave & 21st St, Chicago, Ill.
Jenkins Bros, 80 White St, New York, N. Y.
Keckley, O C, Co, 400 W Madison St, Chicago, Ill.
Kennedy Valve Mfg Co, Elmira, N. Y.
Adv page 191
Ludlow Valve Mfg Co, Ft of Adams St, Troy, N. Y.
Lunkenheimer Co, PO Box 360, Annex Station, Cincinnati, O.
Adv pages 221, 240, 275, 276, 278, 279, 280
Mason-Neilan Regulator Co, 1186 Adams St, Boston, Mass.
Merco-Nordstrom Valve Co, Lexington Ave, Pittsburgh, Pa.
Mercoid Corp, 4229 Belmont Ave, Chicago, Ill.
Minneapolis-Honeywell Regulator Co, Minneapolis, Minn.
Northern Equipment Co, 1221 Grove Drive, Erie, Pa.
Adv page 153
Philadelphia Gear Works, Erie Ave & G St, Phila, Pa.
Adv page 57
Powell, Wm, Co, Cincinnati, O.
Adv pages 166, 167

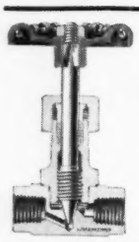
LUNKENHEIMER

VALVES FOR FINE REGULATION

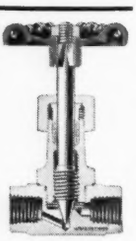


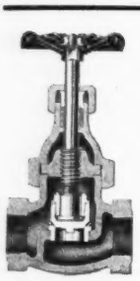
BRONZE NEEDLE VALVES
200 lb. S. P.
Fig. 906 . . . . . .
Fig. 1205 with Gland



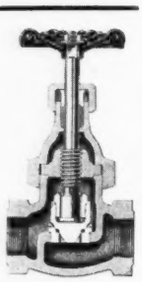


STEEL NEEDLE VALVES
3000 lb. W. O. G.
Fig. 1728 Carbon
Fig. 1730 Stainless



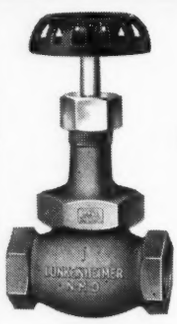


STEEL GLOBE VALVES
Bonnet-Thread-Bushing
600 lb. S. P.
Fig. 1720 Full-Way
Fig. 1722 Throttling



ESTABLISHED 1862
THE LUNKENHEIMER CO.
"QUALITY"
CINCINNATI, OHIO, U. S. A.

LUNKENHEIMER



"N-M-D" VALVES
NON-METALLIC DISC
Easily and Quickly Renewed
150 lb. S. P.
For steam, hot water, cold water, air, gasoline, gas, butane, propane.
Descriptive Circular On Request
Lunkenheimer Distributors
In All Industrial Centers
ESTABLISHED 1862
THE LUNKENHEIMER CO.
"QUALITY"
CINCINNATI, OHIO, U. S. A.

I-S Products Corp, 4530 Germantown Ave, Philadelphia, Pa.
Ruggles-Klingemann Mfg Co, Salem, Mass.
Tagliabue, C J, Mfg Co, Park & Nostrand Aves, Brooklyn, N. Y.
Vapor Car Heating Co, 80 East Jackson Blvd, Chicago, Ill.
Vogt, Henry, Machine Co, 1000 W Ormsby St, Louisville, Ky.
Adv page 46
Walworth Co, 60 E 42nd St, New York, N. Y.
Adv pages 168, 169
Webster, Warren, & Co, Camden, N. J.
Adv page 272
Wheelco Instruments Co, 863 West Harrison St, Chicago, Ill.
Adv pages 203, 216, 254, 258

VALVES, NEEDLE

Crane Co, 836 S Michigan Ave, Chicago, Ill.
Adv page 123
Darling Valve & Mfg Co, Williamsport, Pa.
Adv page 27
Edward Valve & Mfg Co, 1150 W 145th St, East Chicago, Ind.
Adv page 277
Jarecki Mfg Co, Erie, Pa.
Jenkins Bros, 80 White St, New York, N. Y.
Limbert, Geo B, & Co, 570 Fulton St, Chicago, Ill.
Lunkenheimer Co, Box 360, Annex Station, Cincinnati, Ohio
Adv pages 221, 240, 275, 276, 278, 279, 280
Milwaukee Valve Co, Milwaukee, Wis.
Minneapolis-Honeywell Regulator Co, 2747 4th Ave S, Minneapolis, Minn.
Nugent, Wm Co, 402 N Hermitage Ave, Chicago, Ill.
Ohio Injector Co, 150 Ohio Ave, Wadsworth, Ohio
Parker Appliance Co, 17325 Euclid Ave, Cleveland, Ohio
Pelton Water Wheel Co, San Francisco, Calif.
Powell, Wm, Co, Cincinnati, Ohio
Adv pages 166, 167
Reading, Pratt & Cady Div, American Chain & Cable Co. Reading, Pa.
Adv pages 176, 177
Swift Lubricator Co, 330 James Bldg, Elmira, N. Y.
Taylor Instrument Cos, 95 Ames St, Rochester, N. Y.
Vogt, Henry, Machine Co, 1000 W Ormsby St, Louisville, Ky.
Adv page 46
Walworth Co, 60 E 42nd St, New York, N. Y.
Adv pages 168, 169
Williams, D T, Valve Co, 2854 Spring Grove Ave, Cincinnati, Ohio

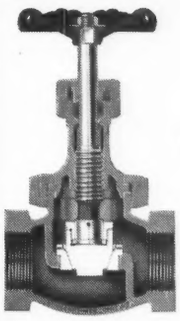
VALVES, PLUG

Barrett, Haentjens & Co, Hazleton, Pa
Belfield, H, Co, 435 N Broad St, Phila, Pa.
Bordo, L J, Co, Glenside, Pa.
Corning Glass Works, Dept I P, Corning, N. Y.
Crane Co, 836 S Michigan Ave, Chicago, Ill.
Adv page 123
Duriron Co, Inc, Dayton, Ohio
Fairbanks Co, 397 Lafayette St, New York, N. Y.
Adv page 170
Golden-Anderson Valve Specialty Co, 1315 Fulton Bldg, Pittsburgh, Pa.
Adv page 140
Gorton Heating Corp., Cranford, N. J.
Hancock Valve Div, 143 Elias St, Bridgeport, Conn.
Homestead Valve Mfg Co, Box 210, Coraopolis, Pa.
Adv page 197
Jenkins Bros, 80 White St, New York, N. Y.
Klingerit, Inc, 16 Hudson St, New York, N. Y.
Adv page 279
Merco-Nordstrom Valve Co, Lexington Ave, Pittsburgh, Pa.
Ohio Injector Co, 150 Ohio Ave, Wadsworth, Ohio
Parker Appliance Co, 17325 Euclid Ave, Cleveland, Ohio
Philadelphia Valve Co, Aramingo Ave, Philadelphia, Pa.
Powell, Wm Co, Cincinnati, O.
Adv pages 166, 167
Reading-Pratt & Cady Div, Reading, Pa.
Adv pages 176, 177
Reed Valve Div, PO Box 2119, Houston, Texas
Taylor Instrument Cos, Rochester, N. Y.
Vogt, Henry, Machine Co, 1000 W Ormsby St, Louisville, Ky.
Adv page 46
Walworth Co, Inc, 60 E. 42nd St, New York, N. Y.
Adv pages 168, 169
Williams, D T, Valve Co, Spring Grove Ave, Cincinnati, O.

VALVES, PUMP AND COMPRESSOR

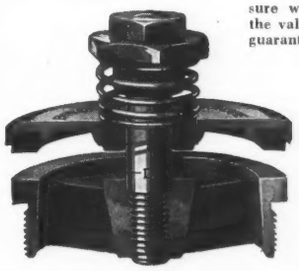
Anchor Packing Co, 401 N Broad St, Philadelphia, Pa.
Belfield, H, Co, 435 N Broad St, Phila, Pa.
Birch Mfg Co, 1523 Sedgwick St, Chicago, Ill.
Adv page 279
Crane Co, 836 S Michigan Ave, Chicago, Ill.
Adv page 123
Dick, R & J, Co, Inc, Colfax Ave, Passaic, N. J.
Durabla Mfg Co, 114 Liberty St, Room 202, New York, N. Y.
Garlock Packing Co, 400 Main St, Palmyra, N. Y.
Adv page 42
Hill Pump Valve Co, Chicago, Ill.
Adv page 279
Jenkins Bros, 80 White St, New York, N. Y.
Klingerit, Inc, 16 Hudson St, New York, N. Y.
Adv page 279
Klipfel Mfg Co, 2651 W Harrison St, Chicago, Ill.
Linear Packing & Rubber Co., State Rd & Levick St, Phila, Pa.

LUNKENHEIMER



PLUG TYPE
Seat and Disc Valves
150-200-300-350 lbs. S. P.
A valve that will give you real service.
Descriptive Circular On Request
Lunkenheimer Distributors
In All Industrial Centers
ESTABLISHED 1862
THE LUNKENHEIMER CO.
"QUALITY"
CINCINNATI, OHIO, U. S. A.

BIRCH PUMP VALVES

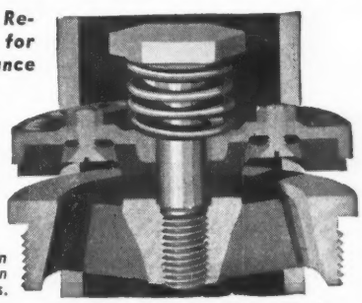


Have a metal back to withstand the pressure with rubber composition discs to seal the valve. Used for hot or cold water and guaranteed for service. Also increase pumping capacity.
With installations from small boiler feed pumps with 8 valves to 1476 valves and seats complete in individual pumps. Some city pumping stations have 7000 valves with years of continued service.
Railroads and large Industrial Corporations with chains of plants have pumps equipped with "BIRCH PUMP VALVES". Why not yours?

BIRCH
MANUFACTURING CO.
1521-23 Sedgwick St.
Chicago, Ill.

HILL *Improved* PUMP VALVES

The Valve with the Renewable Feature . . . for better pump performance



End pump troubles and restore old pumps to original efficiency. Because of the exclusive Hill design no matter in what position the valve rotates *constant contact* is maintained over the full bearing surface. Efficient, economical, accurate, durable.
● *Send today for bulletin and get complete facts on Hill Improved Pump Valves.*

HILL PUMP VALVE CO.
2728 ELSTON AVE. CHICAGO, ILLINOIS

THE NEW LINE OF

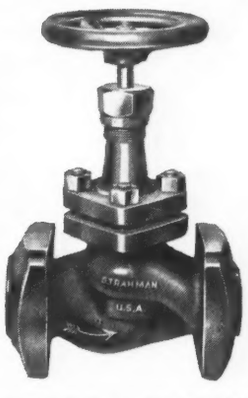
STRAHMAN SEATLESS TYPE VALVES

(Klinger Pat.)

FOR ALL PRESSURES. HIGH OPERATING EFFICIENCIES AT LOW MAINTENANCE COST.

We also manufacture the famous Klingerit Line of Asbestos Sheet Packing and Gaskets. Also Liquid Level Gages.

WRITE FOR COMPLETE DETAILS



KLINGERIT, INC.
16 HUDSON ST. NEW YORK, N. Y.

Lunkenheimer Co, Box 360, Annex Station, Cincinnati, O.
Adv pages 221, 240, 275, 276, 278, 279, 280
McAlear Mfg Co, Chicago, Ill.
Phoenix Specialty Mfg Co, 155 Wooster St, New York, N. Y
Watson-Stillman Co, Roselle, N. J.
Adv page 226
Williams Gauge Co, 1938 Penna Ave, N S, Pittsburgh, Pa.
Adv page 274
Worthington Pump & Machine Corp, Harrison, N. J.
Adv page 171

VALVES, RADIATOR, HEATING

American District Steam Co, 70 Bryant St, N Tonawanda, N. Y.
Adv page 160
American Radiator & Std Sanitary Corp, 40 W 40th St, New York, N. Y.
Barnes & Jones Inc, 128 Brookside Ave, Jamaica Plain, Mass.
Belfield, H Co, 435 N Broad St, Philadelphia, Pa.
Burnham Boiler Corp, Irvington, N. Y.
Cashin, W D Co, 69 A St, Boston, Mass.
Crane Co, 836 S Michigan Ave, Chicago, Ill.
Adv page 123
Cryer Trap & Valve Co, 366 Madison Ave, New York, N. Y.
Adv page 271
Detroit Lubricator Co, 5900 Trumbull Ave, Detroit, Mich.
Dunham, C A, Co, 450 E Ohio St, Chicago, Ill.
Fairbanks Co, 397 Lafayette St, New York, N. Y.
Adv page 170
Gorton Heating Corp, Cranford, N. J.
Hoffman Specialty Co, 1001 York St, Indianapolis, Ind.
Illinois Engrg Co, Racine Ave & 21st St, Chicago, Ill.
Jenkins Bros, 80 White St, New York, N. Y.
Kennedy Valve Mfg Co, Elmira, N. Y.
Adv page 191
Limbert, Geo B, & Co, 570 Fulton St, Chicago, Ill.
McAlear Mfg Co, Chicago, Ill.
Marsh, J P, & Co, 2049 Southport Ave, Chicago, Ill.
Milwaukee Valve Co, Milwaukee, Wis.
Minneapolis-Honeywell Regulator Co, 2747 4th Ave S, Minneapolis, Minn.
Monash-Younker Co, 1315 W Congress St, Chicago, Ill.
Ohio Brass Co, Mansfield, Ohio
Pierce Butler Radiator Corp, 701 Nichols Ave, Syracuse, N.Y.
Sarco Co, 475 5th Ave, New York, N. Y.
Sterling Inc, Milwaukee, Wis.
Webster, Warren & Co, Camden, N. J.
Adv page 272

VALVES, REDUCING, REGULATING

Alco Valve Co, 2628 Big Bend, Blvd, St Louis, Mo.
American District Steam Co, 70 Bryant St, Tonawanda, N. Y.
Adv page 160
Atlas Valve Co, 289 South St, Newark, N. J.
Adv page 281
Atwood & Morrill Co, Salem, Mass.
Bailey Meter Co, 1036 Ivanhoe Rd. Cleveland, Ohio
Adv pages 14, 15
Bastian-Blessing Co, 4201 Peterson Ave, Chicago, Ill.
Belfield, H, Co, 435 N Broad St, Phila, Pa.
Bristol Co, Waterbury, Conn.
Cash, A W, Co, 402 N Eldorado St, Decatur, Ill.
Cash Universal Regulator Co, Marshalltown, Iowa
Chaplin-Fulton Mfg Co, 28-40 Penn Ave, Pittsburgh, Pa.
Cochrane Corp, 3106 N 17th St, Philadelphia, Pa.
Adv pages 154, 233, 240, 261, 269
Crane Co, 836 S Michigan Ave, Chicago, Ill.
Adv page 123
Davis Regulator Co, 2540 S Washtenaw Ave, Chicago, Ill.
Defender Automatic Regulator Co, St. Louis, Mo.
Eddington Metal Specialty Co, Box K, Eddington, Pa.
Adv pages 244, 252
Fisher Governor Co, 203 S 1st Ave, Marshalltown, Iowa
Foster Engrg Co, 109 Monroe St, Newark, N. J.
Adv pages 230, 257, 259, 276
General Controls Co, 267 5th Ave, New York, N. Y.
General Regulator Corp, 165 Broadway, New York, N. Y.
Adv page 127
Golden-Anderson Valve Specialty Co, 1315 Fulton Bldg, Pittsburgh, Pa.
Adv page 140
Grove Regulator Co, 1190 67th St, Oakland, Calif.
Hagan Corp, Hagan Bldg, Pittsburgh, Pa.
Adv pages 30, 31
Hauck Mfg Co, 126 10th St, Brooklyn, N. Y.
Hays Corp, 905 8th St, Michigan City, Ind.
Heacon Inc, Luzerne & 2nd Sts, Philadelphia, Pa.
Illinois Engrg Co, Racine Ave, Chicago, Ill.
Johnson Service Corp, 509 E Michigan St, Milwaukee, Wis.
Keckley, O C, Co, 400 W Madison St, Chicago, Ill.
Kieley & Mueller, Inc, 2015-2033 43rd St, No Bergen, N. J.
Klipfel Mfg Co, 2651 W Harrison St, Chicago, Ill.
Knowles Mushroom Ventilator Co, Montclair, N. J.
Leslie Co, Lyndhurst, N. J.
Limbert, Geo B, & Co, 570 Fulton St, Chicago, Ill.
Logansport Machine, Inc, 914 Cotner Rd, Logansport, Ind.
McAlear Mfg Co, Chicago, Ill.
Mason-Neilan Regulator So, 1186 Adams St, Boston, Mass.
Mercoid Corp, 4229 Belmont Ave, Chicago, Ill.
Mercon Regulator Co, 2357 N 29th St, Milwaukee, Wis.

LUNKENHEIMER

"King-Clip" Gate Valves

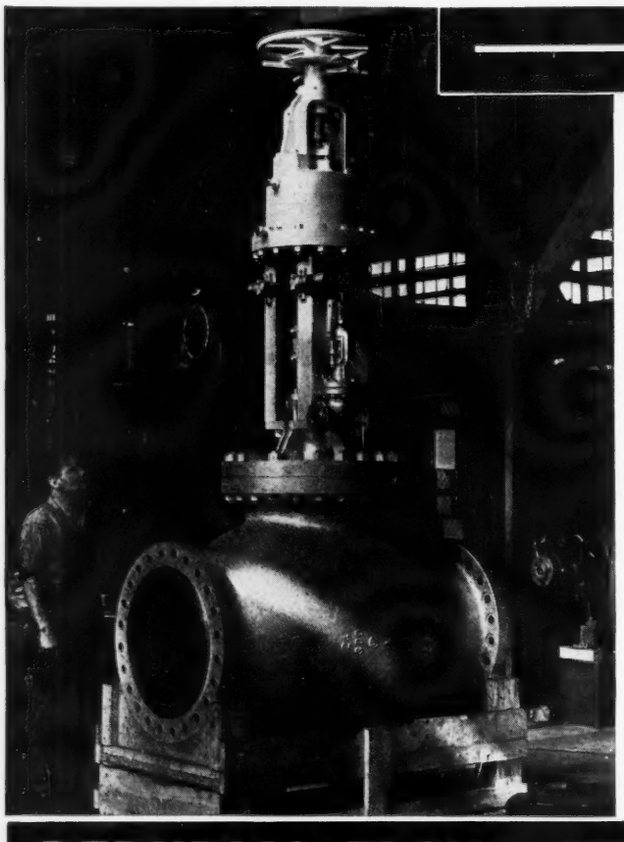
Iron Body Bronze Mounted and All-Iron 150 lb. S. P.

Stands the gaff of general service.

Descriptive Circular On Request

Lunkenheimer Distributors In All Industrial Centers

ESTABLISHED 1862
THE LUNKENHEIMER CO.
"QUALITY"
CINCINNATI, OHIO, U.S.A.



VALVES

Regulating and Pressure Reducing

For your key jobs, where valves must not fail—where they must continuously and accurately regulate the pressures and flows of steam and water on which other vital processes depend—Republic-Smoot valves give you the dependability you need.

ANY STEAM CONDITIONS

These valves are of the gradual-opening, high-lift, double-seated type, lever or hydraulic-operated, built to A. S. A. standards for steam conditions up to 1500 lb. per sq. in., 950 F and capacities up to 1,000,000 lb. of steam an hour.

STABLE REGULATION

Republic-Smoot valves will regulate accurately from maximum flow down to 2 per cent of maximum.

CUSTOM-MADE CONSTRUCTION

Republic-Smoot valves are built for any piping condition, with inlet and outlet sizes proportioned for specific pressure reductions. Special steels are used, depending on service requirements.

ONE-PIECE STEM

Valve stem and discs are machined from a single stainless steel forging.

Let a Republic Engineer consult with you on your specific pressure and flow regulating problems.

FOR COMPLETE DETAILS WRITE FOR BULLETIN No. S-40

REPUBLIC FLOW METERS CO. 2222 DIVERSEY PKWY. CHICAGO, ILLINOIS

Minneapolis - Honeywell Regulator Co, 4490 Wayne Ave, Phila, Pa.
Monarch Mfg Works, 2731 E Westmoreland St, Phila, Pa.
Mueller Co, Decatur, Ill.
Natural Gas Equip Inc, 539 Petroleum Bldg, Los Angeles.
Norgren, C A, Co, 210 Santa Fe Drive, Denver, Colo.
Northern Equipment Co, 1221 Grove Drive, Erie, Pa.
Adv Page 119
Powell, Wm, Co, Cincinnati, O.
Adv pages 166, 167
Reading-Pratt & Cady Div, Reading, Pa.
Adv pages 176, 177
Republic Flow Meters Co, 2222 Diversey Pkwy, Chicago, Ill.
Adv pages 215, 221, 241, 280
R-S Products Corp, 4530 Germantown Ave, Philadelphia.
Ruggles-Klingemann Mfg Co, Salem, Mass.
Schade Valve Mfg Co, 2527 N Bodine St, Philadelphia, Pa.
Schutte & Koerting Co, 12th & Thompson Sts, Philadelphia.
Spence Engrg Co, Inc, 61 Grant St, Walden, N. Y.
Squires, C E, Co, E 40th St & Kelley Ave, Cleveland, O.
Adv page 287
Staples & Pfeiffer, Ltd, 538 Bryant St, San Francisco, Calif.
Stickle Steam Specialties Co, 2217 Valley Ave, Indianapolis, Ind.
Strong, Carlisle & Hammond Co, 1392 W 3rd, Cleveland, O.
Adv page 285
Swartwout Co, 18511 Euclid Ave, Cleveland, Ohio
Adv page 312
Tagliabue, C J, Mfg Co, Park & Nostrand Aves, Brooklyn, N. Y.
Taylor Instrument Cos, Rochester, N. Y.
Trane Co, 2012 Cameron Ave, La Crosse, Wis.
Triplex Heating Specialty Co, Peru, Ind.
Tryco Products Inc, 1 Railroad Ave, Westfield, Mass.
Tuthill Pump Co, 939 E 95th St, Chicago, Ill.
Vapor Car Heating Co, 80 East Jackson Blvd, Chicago, Ill.
Waters Governor Co, 1123 Oliver Bldg, Boston, Mass.
Watson-Stillman Co, Roselle, N. J.
Adv page 226

VALVES, REFRIGERATION (GATE, GLOBE, CHECK, NEEDLE, RELIEF)

Ashton Valve Co, 165 First St, Cambridge, Mass.
Cash, A W, Co, 402 N Eldorado St, Decatur, Ill.
Crane Co, 836 S Michigan Ave, Chicago, Ill.
Adv page 123
Fostor Engrg Co, 109 Monroe Street, Newark, N. J.
Adv pages 230, 257, 259, 276
Imperial Brass Mfg Co, 564 S Racine Ave, Chicago, Ill.
Jenkins Bros, 80 White St, New York, N. Y.
Lunkenheimer Co, PO Box 360, Annex Sta, Cincinnati, Ohio
Adv pages 221, 240, 275, 276, 278, 279, 280
Mercoid Corp, 4229 Belmont Ave, Chicago, Ill.
Mueller Brass Co, 1925A Lapeer Ave, Port Huron, Mich.
Reading, Pratt & Cady Div, Reading, Pa.
Adv pages 176, 177
Vilter Mfg Co, 2217 S 1st St. Milwaukee, Wis.
Vogt, Henry, Machine Co, 1000 W Ormsby St, Louisville, Ky.
Adv page 46
York Ice Machy Corp, York, Pa.

VALVES, REFRIGERATION, EXPANSION

Alco Valve Co, 2628 Big Bend Blvd, St Louis, Mo.
Cash, A W, Co, 402 N Eldorado St, Decatur, Ill.
Crane Co, 836 S Michigan Ave, Chicago, Ill.
Adv page 123
Detroit Lubricator Co, 5900 Trumbull Ave, Detroit, Mich.
Foster Engineering Co, 109 Monroe St, Newark, N. J.
Adv pages 230, 257, 259, 276
Frigidaire Commercial & Air Cond Div, Dayton, Ohio
Heacon Inc, Luzurne & 2nd Sts, Philadelphia, Pa.
Peerless of America, Inc, Marion, Ind.
Taylor Instrument Cos, 95 Ames St, Rochester, N. Y.
Vogt, Henry, Machine Co, 1000 W Ormsby St, Louisville, Ky.
Adv page 46
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61
York Ice Mach Corp, York, Pa.

VALVES, REFRIGERATION, FLOAT

Alco Valve Co, 2628 Big Bend Blvd, St Louis, Mo.
Crane Co, 836 S Michigan Ave, Chicago, Ill.
Adv page 123
Foster Engineering Co, 109 Monroe St, Newark, N. J.
Adv pages 230, 257, 259, 276
Imperial Brass Mfg Co, 514 S Racine Ave, Chicago, Ill.
Vilter Mfg Co, 2217 S 1st St, Milwaukee, Wis.
York Ice Mach Corp, York, Pa.

VALVES, RELIEF

Ashton Valve Co, 165 1st St, Cambridge, Mass.
Bastian-Blessing Co, 4201 Peterson Ave, Chicago, Ill.
Cash, A W, Co, 402 N Eldorado, Decatur, Ill.
Cochrane Corp, 3106 N 17th St, Philadelphia, Pa.
Adv pages 154, 233, 240, 261, 269
Crane Co, 836 S Michigan Ave, Chicago, Ill.
Adv page 123
Davis Regulator Co, 2540 S Washtenaw Ave, Chicago, Ill.
Edward Valve & Mfg Co, 1150 W 145th St, East Chicago, Ind.
Adv page 277
Fisher Governor Co, 203 S 1st Ave, Marshalltown, Iowa
Foster Engrg Co, 109 Monroe St, Newark, N. J.
Adv pages 230, 257, 259, 276
Keckley, O C, Co, 400 W Madison St, Chicago, Ill.
Kieley & Mueller Inc, 2015-2033 43rd St, N Bergen, N. J.
Klipel Mfg Co, 2651 W Harrison St, Chicago, Ill.
Kunkle Valve Co, Fort Wayne, Ind.
Limbert, Geo B, & Co, 570 Fulton St, Chicago, Ill.
Logansport Machine Inc, Logansport, Ind.
Lonergan, J E, Co, 211 Race St, Philadelphia, Pa.
Adv page 281
Ludlow Valve Mfg Co, Ft of Adams St, Troy, N. Y.
Lunkenheimer Co, Box 360, Annex Station, Cincinnati, Ohio
Adv pages 221, 240, 275, 276, 278, 279, 280
McAlear Mfg Co, Chicago, Ill.
McDonnell & Miller, Wrigley Bldg, Chicago, Ill.
Manning, Maxwell & Moore, Bridgeport, Conn.
Marsh, J P, & Co, 2049 Southport Ave, Chicago, Ill.
Mason - Neilan Regulator Co, 1186 Adams St, Boston, Mass
Milwaukee Valve Co, Milwaukee.
Mueller Brass Co, 1925 A Lapeer St, Port Huron, Mich.
Mueller Co, Decatur, Ill.
Oilgear Co, 1421 W Bruce St, Milwaukee, Wis
Parker Appliance Co, 17325 Euclid Ave, Cleveland, Ohio
Powell, Wm, Co, Cincinnati, O.
Adv pages 166, 167
Reading-Pratt & Cady Div, American Chain & Cable Co, Reading, Pa.
Adv pages 176, 177
Schade Valve Mfg Co, 2527 N Bodine St, Philadelphia, Pa.
Staples & Pfeiffer Ltd, 528 Bryant St, San Francisco, Calif.
Star Brass Mfg Co, 110 E Dedham St, Boston, Mass.
Triplex Heating Specialty Co, Peru, Ind.
Tuthill Pump Co, 929 E 95th St, Chicago, Ill.
Vapor Car Heating Co, 80 East Jackson Blvd, Chicago, Ill.
Vickers Inc, Detroit, Mich.
Watson-Stillman Co, Roselle, N. J.
Adv page 226
York Ice Machy Corp, York, Pa.

VALVES, SAFETY

Ashton Valve Co, 165 1st St, Cambridge, Mass.
Atwood & Morrill Co, Salem, Mass.
Bastian-Blessing Co, 4201 Peterson Ave, Chicago, Ill.
Belfield, H, Co, 435 N Broad St, Phila, Pa.
Brown Instrument Co, 4490 Wayne Ave, Philadelphia, Pa.
Adv pages 51, 240, 254, 258, 266
Cash, A W, Co, 402 N Eldorado St, Decatur, Ill.
Coale, Muffler & Safety Valve Co, Baltimore, Md.
Crane Co, 836 S Michigan Ave, Chicago, Ill.
Adv page 123
Crosby Steam Gage & Valve Co, 40 Church St, New York, N. Y.
Foster Engrg Co, 109 Monroe St, Newark, N. J.
Adv pages 230, 257, 259, 276
Hagan Corp, Hagan Bldg, Pittsburgh, Pa.
Adv pages 30, 31
Hancock Valve Div, 143 Elias St, Bridgeport, Conn.
Jarecki Mfg Co, Erie, Pa.
Jenkins Bros, 80 White St, New York, N. Y.
Kennedy Valve Mfg Co, Elmira, N. Y.
Adv page 191
Kunkle Valve Co, Fort Wayne, Ind.
Leahy Mfg Co, Los Angeles, Calif.
Lonergan, J E, Co, 211 Race St, Philadelphia, Pa.
Adv page 281
Lunkenheimer Co, Box 360, Annex Station, Cincinnati, Ohio
Adv pages 221, 240, 275, 276, 278, 279, 280
McDonnell & Miller, Wrigley Bldg, Chicago, Ill.
Mercoid Corp, 4229 Belmont Ave, Chicago, Ill.
Northern Equipment Co, 1221 Grove Drive, Erie, Pa.
Adv page 119
Pittsburgh Valve & Fittings Corp, Barberton, Ohio
Powell, Wm, Co, Cincinnati, O.
Adv pages 166, 167
Ruggles-Klingeman Mfg Co, 38 Chauncy St, Boston, Mass.

BRONZE POP SAFETY VALVES FOR PORTABLE BOILERS—to A. S. M. E. CODE SPECIFICATIONS

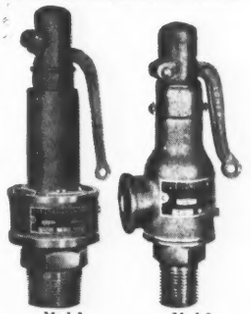
Made with high lift and adjustable blow down ring . . . Equalizing top and bottom spring steps . . . Steel spindles . . . Powerful cam lifting lever . . . Fitted for seal or lock . . . In every way complies with the A. S. M. E. Code!

Ask about them; write for catalog.

J. E. LONERGAN COMPANY
Race and Second Sts.

Lonergan

70th Anniversary — Since 1872, makers of precision Pressure Gauges, Pop Safety Valves, Relief Valves, Temperature Gauges, Water Gauges, Oil Gauges and Lubricating Specialties.



Model KDP. Top outlet. *Model ODP. Side outlet.*

ATLAS Regulating Valves *for* Every Service

Although most ATLAS regulating devices are listed in this issue of POWER we are repeating the principal products below for convenient checking.

Fig. 230. This ATLAS Lever Operated Control Valve is still "going places." Are you acquainted with it?

The Atlas Valve Company has been making Regulating Valves *exclusively* for nearly a half century. *"Regulating Valves for Every Service"* is the Atlas slogan.

Make it your good habit to put all regulating problems up to ATLAS, always. In other words, Standardize on Atlas Regulating Valves.

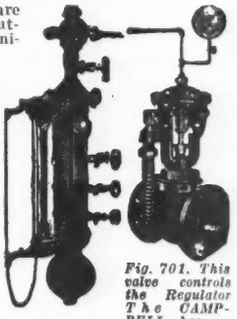


Fig. 700. The CAMPBELL Feed Water Regulator. *Fig. 701. This valve controls the Regulator The CAMPBELL has no floats, thermostats, generators, or moving parts.*

Fig. 503 High Pressure VICTOR Damper Regulator. We make them for nearly all pressures and services.

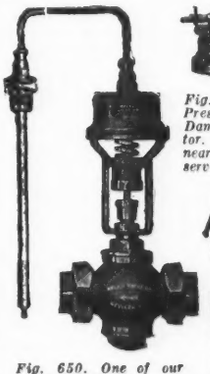


Fig. 650. One of our VICTOR Temperate Regulators

To save time, check the list of principal Atlas products below, write your name, firm, and address on the margin, tear out, include any special facts we may need, mail, and you will hear from us promptly.

ATLAS VALVE COMPANY
REGULATING VALVES FOR EVERY SERVICE
289 South St., Newark, N. J.
Representatives in Principal Cities

Please send information on the following Atlas products without obligating me in any way:—

☐ Temperature Regulators
☐ Float Valves
☐ Campbell Boiler Feed Water Regulators
☐ Reducing Valves
☐ Exhaust Control System
☐ Damper Regulators
☐ Pump Governors
☐ Thermostats
☐ Balanced Valves
☐ Control Valves
☐ Humidity Controllers
☐ Oil Control Cocks
☐ Pressure Regulators

Schade Valve Mfg Co, 2527 N Boden St, Philadelphia, Pa.
Schutte & Koerting Co, 12th & Thompson Sts, Phila, Pa.
Standard Valve Mfg Co, Boston, Mass.
Star Brass Mfg Co, 110 E Dedham St, Boston, Mass.
Vapor Car Heating Co, 80 East Jackson Blvd, Chicago, Ill.
Vickers, Inc, Detroit, Mich.
Watson-Stillman Co, Roselle, N. J.
Adv page 226
Westinghouse Air Brake Co, Wilmerding, Pa.
York Ice Machinery Corp, York, Pa.
York Oil Burner Corp, York, Pa.

VALVES, SOLENOID

Alco Valve Co, 2628 Big Bend Blvd, St Louis, Mo.
Barber Colman Co, Rockford, Ill.
Crane Co, 836 S Michigan Ave, Chicago, Ill.
Adv page 123
Cutler-Hammer, Inc, 315 N 12th St, Milwaukee, Wis.
Adv page 107
Davis Regulator Co, 2540 S Washtenaw Ave, Chicago, Ill.
Detroit Lubricator Co, 5900 Trumbull Ave, Detroit, Mich.
Electric Valve Mfg Co, 67 Murray St, New York, N. Y.
Everlasting Valve Co, 53 Fisk St, Jersey City, N. J.
Adv page 158
Foster Engineering Co, 109 Monroe St, Newark, N. J.
Adv pages 230, 257, 259, 276
Friez, Julien P, Div, 4 N Central Ave, Baltimore, Md.
General Controls Co, 810 Allen Ave, Glendale, Calif.
General Electric Co, Schenectady, N. Y.
Adv pages 32, 33
Golden Anderson Valve Specialty Co, Pittsburgh, Pa.
Adv page 140
Keckley, O C, Co, 400 W Madison St, Chicago, Ill.
McDonnell & Miller, Wrigley Bldg, Chicago, Ill.
Mercoid Corp, 4229 Belmont Ave, Chicago, Ill.
Minneapolis-Honeywell Regulator Co, 2747 4th Ave S, Minneapolis, Minn.
Nicholson, W H, & Co, 125 Oregon St, Wilkes Barre, Pa.
Adv pages 227, 269, 271
Northern Equipment Co, 1221 Grove Drive, Erie, Pa.
Adv page 119
Oilgear Co, 1421 W Bruce St, Milwaukee, Wis.
Penn Electric Switch Co, Goshen, Ind.
Pfening, Fred D, Co, 1075 W 5th Ave, Columbus, Ohio
R-S Products Corp, 4530 Germantown Ave, Philadelphia, Pa.
Ruggles-Klingeman Mfg Co, 38 Chauncy St, Boston, Mass.
Supreme Electric Products Corp, 123 Ames St, Rochester, N. Y.
Vickers, Inc, Detroit, Mich.
Watson-Stillman Co, Roselle, N. J.
Adv page 226
Wheelco Instruments Co, 863 West Harrison St, Chicago, Ill.
Adv pages 203, 216, 254, 258
York Ice Machy Corp, York, Pa.

VALVES, THERMOSTATIC

American Radiator & Standard Sanitary Corp, 40 W 40th St, New York, N. Y.
Atlas Valve Co, 289 South St, Newark, N. J.
Adv page 281
Bristol Co, Waterbury, Conn.
Foster Engrg Co, 109 Monroe St, Newark, N. J.
Adv pages 230, 257, 259, 276
Fulton Sylphon Co, Knoxville, Tenn.
Adv page 258
General Controls Co, 267 5th Ave, New York, N. Y.
Hagan Corp, Hagan Bldg, Pittsburgh, Pa.
Adv pages 30, 31
Hoffman Specialty Co, Waterbury, Conn.
Mason-Neilan Regulator Co, 1186 Adams St, Boston, Mass.
Mercoid Corp, 4229 Belmont Ave, Chicago, Ill.
Monash-Younker Co, Chicago, Ill.
Northern Equipment Co, 1221 Grove Drive, Erie, Pa.
Adv page 119
Powers Regulator Co, 2815 Greenview Ave, Chicago, Ill.
Ruggles-Klingeman Mfg Co, 38 Chauncy St, Boston, Mass.
Sarco Co, Inc, 183 Madison Ave, New York, N. Y.
Spence Engrg Co, Inc, 61 Grant St, Walden, N. Y.
Taylor Instrument Cos, Rochester, N. Y.

VARNISHES, INSULATING

Bakelite Corp, 247 Park Ave, New York, N. Y.
Brown, David C, Co, 17532 Wisconsin, Detroit, Mich.
General Electric Co, Schenectady, N. Y.
Adv pages 32, 33
Keystone Varnish Co, 71 Otsego St, Brooklyn, N. Y.
Martindale Elec Co, 1385 Hird Ave, Cleveland, O.
Sherwin-Williams Co, Cleveland, Ohio
Tropical Paint & Oil Co, Cleveland, Ohio
Vita-Var Corp, Newark, N. J.
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61

VENTILATING SYSTEMS, VENTILATORS

Allen, E H, Co, Dept P, 22 Dorrance St, Boston, Mass.
American Blower Corp, 6000 Russell St, Detroit, Mich.
American Foundry Equipment Co, Mishawaka, Ind.
Arex Co, 333 N Michigan Ave, Chicago, Ill.
Buffalo Forge Co, 488 Broadway, Buffalo, N. Y.
Adv pages 199
Burt Mfg Co, 232 Main St, Akron, Ohio
Chelsea Fan & Blower Co, 1206 Grove St, Irvington, N. J.
Clarage Fan Co, 619 Porter St, Kalamazoo, Mich.
Adv page 147
De Bothezat Ventilating Equipment Div, East Moline, Ill.
Garden City Fan Co, 332 S Michigan Ave, Chicago, Ill.
Graybar Electric Co, 420 Lexington Ave, New York, N. Y.
Adv pages 214, 234, 243, 261, 265, 282, 284
Hastings Air Conditioning Co, Hastings, Neb.
Ilg Electric Ventilating Co, Chicago, Ill.
Iona Ventilator Co, 2821–29 Dauphin St, Philadelphia, Pa.
Kirk & Blum Mfg Co, Spring Grove Ave, Cincinnati, O.
Nesbitt, John J, Inc, State Rd & Rhawn St, Philadelphia, Pa.
South Bend Air Products Inc, South Bend, Ind.
Adv page 224
Sturtevant, B F, Co, 47 Readville St, Boston, Mass.
Adv pages 40, 41
Swartwout Co, 18511 Euclid Ave, Cleveland, Ohio
Adv page 312
Trane Co, 2012 Cameron Ave, La Crosse, Wis.
Wagner Electric Corp, St Louis, Mo.
Wing, L J, Mfg Co, W 14th St & 7th Ave, New York, N. Y.
Adv page 194

VIBRATION ISOLATION

(See Isolation, Vibration)

WALLS, BOILER-FURNACE, AIR-COOLED

Acme Brick Co, Fort Worth, Tex.
American Arch Co, Inc, 68 E 42nd St, New York, N. Y.
Bernitz Furnace Appliance Co, 89 Broad St, New York, N. Y.
Bigelow-Liptak Corp, 2840 W Grand Blvd, Detroit, Mich.
Chicago Fire Brick Co, 1463 Elston Ave, Chicago, Ill.
Detrick, M H, Co, 140 S Dearborn, Chicago, Ill.
DeWolf Furnace Corp, 77 South Ave, Rochester, N. Y.
Drake Non-Clinkering Furnace Block Co, Beekman St, New York, N. Y.

VENTILATION

ONE ITEM OF THE GRAYBAR 60,000

All types of fans and blowers for every plant and office requirement.

DISTRIBUTED BY

GraybaR ELECTRIC COMPANY

IN OVER 80 PRINCIPAL CITIES

Boiler Water Conditioning Chemicals

TANALGINATE*
PHOSPHATE ADJUNCTS
ALKALIS

Formulated treatments in briquette, powder or liquid form. Based upon laboratory analysis of water samples and their correlation with operating conditions.

*Reg. U. S. Pat. Off.

THE BIRD-ARCHER CO.

Scientific Water Conditioning
SINCE 1883

New York, N. Y., 100 Madison Ave.
Chicago, Ill., Wrigley Building
Philadelphia, Pa., 1337 No. American St.
The Bird-Archer Co., Ltd., McGill Building, Montreal, Canada

PLIBRICO *Air-Cooled* WALLS

SECTIONALLY supported linings for severe service. Reduce repair cost; permit higher ratings; furnish pre-heated air.

New "Type V" construction installed at moderate cost without critical materials and high priorities. Involves no castings or steelwork beyond usual boiler buckstays—no special tile. Plibrico air-cooled center wall readily installed in battery settings. *Catalog Free.*

PLIBRICO JOINTLESS FIREBRICK CO.
1818 KINGSBURY ST. CHICAGO, ILLINOIS

Engineer Co, 75 West St, New York, N. Y.
Adv page 185
Furnace Economy Co, 201 N Wells St, Chicago, Ill.
Kennedy-Van Saun Mfg & Engrg Corp, 2 Park Ave, New York, N. Y.
Laclede-Christy Clay Products Co, 411 N 7th, St Louis, Mo.
McLeod & Henry Co Inc, 31 Monroe St, Troy, N. Y.
Plibrico Jointless Firebrick Co, 1818 Kingsbury, Chicago, Ill.
Adv pages 205, 206, 255, 282
Ramtite Co, 2563 W 18th St, Chicago, Ill.
Reintjes, Geo P, Co, 2517 Jefferson, Kansas City, Mo.
Seaboard Refractories Co, Box 151, Perth Amboy, N. J.

WALLS, BOILER-FURNACE, WATER-COOLED

Acme Brick Co, Fort Worth, Tex.
American Engrg Co, Aramingo Ave, Philadelphia, Pa.
Adv pages 12, 13
Babcock & Wilcox Co, 85 Liberty St, New York, N. Y.
Adv pages 8, 9, 10, 11
Bernitz Furnace Appliance Co, 89 Broad St, New York, N. Y.
Bigelow-Liptak Corp, 2840 W Grand Blvd, Detroit, Mich.
Combustion Engrg Co, Inc, 205 Madison Ave, New York, N. Y.
Adv pages 16, 17
Edge Moor Iron Works, 30 Rockefeller Plaza, New York, N. Y.
Adv page 182
Foster Wheeler Corp, 165 Broadway, New York, N. Y.
Adv pages 38, 39
Keeler, E, Co, Williamsport, Pa.
Adv page 125
Kennedy-Van Saun Mfg & Engrg Corp, 2 Park Ave, New York, N. Y.
Plibrico Jointless Firebrick Co, 1818 Kingsury, Chicago, Ill.
Adv pages 205, 206, 255, 282
Riley Stoker Corp, 999 Neponset St, Worcester, Mass.
Adv pages 96, 97
Springfield Boiler Co, 1903 E Capitol Ave, Springfield, Ill.
Adv pages 28, 29
Union Iron Works, Erie, Pa.

WASHERS, AIR

Air & Refrigeration Corp, 475 Fifth Ave, New York, N. Y.
American Blower Corp, 6000 Russell St, Detroit, Mich.
Ballantyne Co, Omaha, Neb.
Buffalo Forge Co, 488 Broadway, Buffalo, N. Y.
Adv page 199
Clarage Fan Co, 619 Porter St, Kalamazoo, Mich.
Adv page 147
Kauffman Air Conditioning Corp, St Louis, Mo
Trane Co, 2012 Cameron Ave, La Crosse, Wis.
Vilter Mfg Co, 2217 S 1st St, Milwaukee, Wis.
York Ice Machy Corp, York, Pa.

WATER COLUMNS

Bordo, L J, Co, 115 New St, Glenside, Pa.
Corning Glass Works, Dept IP, Corning, N. Y.
Crane Co, 836 S Michigan Ave, Chicago, Ill.
Adv page 123
Diamond Power Specialty Corp, Box 288, Detroit, Mich.
Adv pages 116, 117
Ernst Water Column & Gage Co, Livingston, N. J.
Adv page 150
Huyette, Paul B, Co, 403 N Broad St, Philadelphia, Pa.
Adv page 144
Jarecki Mfg Co, Erie, Pa.
Lunkenheimer Co, Box 360, Annex Station, Cincinnati, Ohio
Adv pages 221, 240, 275, 276, 278, 279, 280
Reliance Gauge Column Co, 5902 Carnegie Ave, Cleveland.
Adv pages 52, 53
Schaub, Fred H, Engrg Co, 325 W Huron St, Chicago, Ill.
Star Brass Mfg Co, 110 E Dedham St, Boston, Mass.
Strong, Carlisle & Hammond Co, 1392 W 3rd St, Cleveland, O.
Adv page 285
Swift Lubricator Co, 330 James Bldg, Elmira, N. Y.
Union Iron Works, Erie, Pa.
Williams Gauge Co, 1938 Penna. Ave, N S, Pittsburgh, Pa.
Adv page 274
Wright-Austin Co, Detroit, Mich.
Yarnall-Waring Co, Chestnut Hill, Philadelphia, Pa.
Adv pages 109, 239, 244, 275, 283

WATER PURIFIERS

(See Purifiers, Water)

WATER SOFTENERS

(See Softeners, Water)

WATER STRAINERS

(See Strainers, Water)

WATER-TEST KITS

(See Feedwater-Test Kits)

WATER TREATMENT, BOILER

Allis-Chalmers Mfg Co, Milwaukee, Wis.
Adv pages 6, 7
American K A T Corp, 331 Madison Ave, New York, New York
American Sand-Banum Co, Dept M P, 9 Rockefeller Plaza, New York, N. Y.
Arrow Boiler Compound Co, 3341 Pennsylvania Ave, St Louis, Mo.
Betz. W H & L D, Gillingham & Worth Sts, Philadelphia, Pa.
Adv pages 203, 225, 262, 284
Bird-Archer Co, 400 Madison Ave, New York, N. Y.
Adv pages 225, 238, 282, 283
Buromin Co, Hagan Bldg, Pittsburgh, Pa.
Chemical Solvent Co, P O Box 487, Birmingham, Ala.
Cochrane Corp, 3106 N 17th St, Philadelphia, Pa.
Adv pages 154, 233, 240, 261
Dearborn Chemical Co, 310 S Michigan Ave, Chicago, Ill.
Elgin Softener Corp, 130 N Grove St, Elgin, Ill.
Adv page 283

ELGIN

WATER CONDITIONING EQUIPMENT

- Water Softeners—Zeolite
- Boiler Water Conditioning
- Water Treating Chemicals
- Boiler Sludge Deconcentrators
- Continuous Blowdown Systems
- Water Filtration Equipment

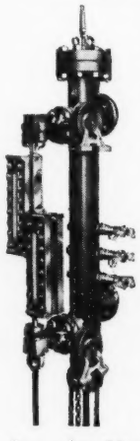
Write for Bulletins

ELGIN SOFTENER CORPORATION
130 North Grove Avenue Elgin, Illinois

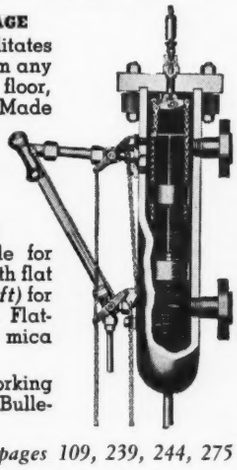
YARWAY
WATER COLUMNS & GAGES

Widely used by public utilities, industrial plants and institutions. Sold as complete units or separate columns and gages.

Floatless Hi-Lo Alarm in column depends for action on displacement of balanced solid weights. Whenever high or low water level destroys balance of weights, valve in top of column opens, admitting steam to alarm whistle. Yarway Water Columns made for all pressures up to 1500 lbs.



SESURE-INCLINED GAGE
(shown at right) facilitates reading water level from any point on boiler room floor, even directly beneath. Made with round glass for pressures up to 400 lbs., with flat glass, pressures to 600 lbs.



VERTICAL GAGES
with round glass made for pressures to 400 lbs., with flat glass *(illustrated at left)* for pressures to 1500 lbs. Flat-glass steel inserts are mica protected.

Send for celluloid working model and descriptive Bulletin WG-1809.

See other Yarway Advertisements on pages 109, 239, 244, 275

YARNALL-WARING CO.
100 MERMAID AVE., PHILA.

Consulting Service on ALL water problems

SURVEYS
PLANT STUDIES
DESIGN *and* SPECIFICATIONS
SERVICE CONTRACTS
CONSULTATIONS
LABORATORY ANALYSES

Preliminary discussions at no charge.

THE BIRD-ARCHER CO.

Scientific Water Conditioning SINCE 1885

New York, N. Y. 100 Madison Ave.
Chicago, Ill. Wrigley Building
Philadelphia, Pa. 4337 No. American St.
The Bird-Archer Co. Ltd. McGill Building, Montreal, Canada

Feedwaters, Inc, 140 Cedar St, New York, N. Y.
Filtrators Co, 96 Liberty St, New York, N. Y.
Graver Tank & Mfg Co, 4816-10 Tod Avenue, E Chicago, Ind.
Haering, D W, & Co, 205 W Wacker Drive, Chicago, Ill.
Hall Laboratories, Inc, Hagan Bldg, Pittsburgh, Pa.
Adv pages 18, 19
Infilco, Inc, 325 W 25th Place, Chicago, Ill.
Loomis-Manning Filter Mfg Co, 1421 S 37th St, Phila, Pa.
Madden, P E, & Co, 352 W Walton St, Chicago, Ill.
Monsanto Chemical Co, St Louis.
National Aluminate Corp, 6222 W 66th Place, Chicago, Ill.
Adv page 113
North American Fibre Prod Co, Cleveland, Ohio
Perolin Co of N. Y., 10 East 40th St, New York, N. Y.
Permutit Co, Dept A, 330 W 42nd St, New York, N. Y.
Adv pages 152, 159
Philadelphia Quartz Co, 121 S 3rd St, Philadelphia, Pa.
Proportioneers Inc, 7 Codding St, Providence, R. I.
Rice, Cyrus Wm, & Co, 15 Noble Ave, Pittsburgh, Pa.
Stover Steel Tank & Mfg Co, Freeport, Ill.
Tennessee Corp, 621 Grant Bldg, Atlanta, Ga.
Warley, Thos C, & Co, 217 Bainbridge St, Phila, Pa.
Water Treatment Co of America, 1159 Hodgkiss St, Pittsburgh, Pa.
Adv page 142
Western Chemical Co, 714 Washington St, Kansas City, Mo.

WATER TREATMENT, CONDENSER, COOLING CIRCUIT

Allis-Chalmers Mfg Co, Milwaukee, Wis.
Adv pages 6, 7
American Sand - Banum Co, Dept MP, 9 Rockefeller Plaza, New York, N. Y.
Betz, W H & L D, Gillingham & Worth Sts, Philadelphia, Pa.
Adv pages 203, 225, 262, 284
Bird-Archer Co, 400 Madison Ave, New York, N. Y.
Adv pages 225, 238, 282, 283
Buromin Co, Hagan Bldg, Pittsburgh, Pa.
Chloramine Corp, 101 Park Ave, New York, N. Y.
Elgin Softener Corp, 130 N Grove Ave, Elgin, Ill.
Adv page 283
Feedwaters Inc, 140 Cedar St, New York, N. Y.
Haering, D W, & Co, 205 W Wacker Drive, Chicago, Ill.
Hall Laboratories, Inc, Hagan Bldg, Pittsburgh, Pa.
Adv pages 18, 19
Infilco, Inc, 325 W 25th Pl, Chicago, Ill.
Loomis-Manning Filter Mfg Co, 1421 S 37th St, Phila, Pa.
Madden, P E, & Co, 352 W Walton St, Chicago, Ill.
Monsanto Chemical Co, St Louis, Mo.
National Aluminate Corp, 6222 W 66th Pl, Chicago, Ill.
Adv page 113
Oakite Products Inc, 23 Thames St, New York, N. Y.
Perolin Co of N. Y., 10 East 40th Street, New York, N. Y.
Philadelphia Quartz Co, 121-124 S 3rd St, Phila, Pa.
Proportioneers, Inc, 7 Codding St, Providence, R. I.
Rice, Cyrus Wm, & Co, 15 Noble St, Pittsburgh, Pa.
Wallace & Tiernan Co, Belleville, N. J.
Water Treatment Co of America, 1159 Hodgkiss St, Pittsburgh, Pa.
Adv page 142

WATERPROOFING COMPOUNDS

(See Compounds, Waterproofing)

ONE ORGANIZATION TO HANDLE ALL WATER PROBLEMS

BOILER, COOLING and PROCESS WATER

W. H. & L. D. Betz provides a complete engineering service for the correct conditioning of boiler, process and cooling water. Recommendations are made after a detailed survey of the individual plant conditions, and a system of plant control is established to assure continuous satisfactory operation. For information, write to the attention of our Engineering Service Division.

★

W. H. & L. D. BETZ
Consultants on ALL Water Problems
FRANKFORD • PHILADELPHIA • PENNA.

LABORATORIES AND ENGINEERS LOCATED THROUGHOUT U. S. A. AND CANADA

WATTHOUR METERS

General Electric Co, Schenectady, N. Y.
Adv pages 32, 33
Graybar Electric Co, 420 Lexington Ave, New York, N. Y.
Adv pages 214, 234, 243, 261, 265, 282, 284
Sangamo Electric Co, Springfield, Ill.
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61

WEIGHING MACHINES

(See Scales, Weigh)

WELDING AND CUTTING OUTFITS, ACETYLENE

Air Reduction Sales Co, 60 E 42nd St, New York, N. Y.
Bastian-Blessing Co, 4201 Peterson Ave, Chicago, Ill.
General Welding & Equipment Co, 268 Northampton St, Boston, Mass.
Linde Air Products Co, 30 E 42nd St, New York, N. Y.
Adv pages 36, 37
Liquid Carbonic Corp, 3100 S Kedzie Ave, Chicago, Ill.
National Cylinder Gas Co, 205 W Wacker Drive, Chicago, Ill.
Smith Welding Equipt Corp, 2633 4th St, S E, Minneapolis, Minn.
Victor Equipment Co, 846 Folsom St, San Francisco, Calif.
Weldcraft Equipment Co, 2623 Liberty Ave, Pittsburgh, Pa.

WELDING MACHINES, ELECTRIC

Air Reduction Sales Co, 60 E 42nd St, New York, N. Y.
Allan Mfg & Welding Co, Inc, Buffalo, N. Y.
Allis-Chalmers Mfg Co, Milwaukee, Wis.
Adv pages 6, 7
Burke Electric Co, Erie, Pa.
Electric Controller & Mfg Co, 2700 E 79th St, Cleveland, Ohio
General Electric Co, Schenectady, N. Y.
Adv pages 32, 33
Harnischfeger Corp, Milwaukee, Wis.
Hobart Bros Co, Troy, Ohio
Ideal Commutator Dresser Co, 1025 Park Ave, Sycamore, Ill.
Lincoln Electric Co, 12818 Coit Rd, Cleveland, Ohio
Marquette Mfg Co, 409 Johnson St, N E, Minneapolis, Minn.
Ryerson, Jos T, & Son, 16th & Rockwell Sts, Chicago, Ill.
Smith Welding Equipt Corp, 2633 4th St, S E, Minneapolis.
Sperry Products, Inc, 1505 Willow Ave, Hoboken, N. J.
Adv page 289
Weldcraft Equipment Co, 2623 Liberty St, Pittsburgh, Pa.
Westinghouse Electric & Mfg Co, E Pittsburgh, Pa.
Adv pages 60, 61

WHISTLES, STEAM

Bass Foundry & Machine Co, Fort Wayne, Indiana
Crane Co, 836 South Michigan Ave, Chicago, Ill.
Adv page 123
Foster Engrg Co, 109 Monroe St, Newark, N. J.
Adv pages 230, 257, 259, 276
Jarecki Mfg Co, Erie, Pa.
Leslie Co, Lyndhurst, N. J.
Lonergan, J F, Co, Race Street, Philadelphia, Pa.
Adv page 281
Nathan Mfg Co, 250 Park Avenue, New York, N. Y.
Powell, Wm, Co, 2525 Spring Grove Ave, Cincinnati, Ohio
Adv pages 166, 167

WINCHES, ELECTRIC, HAND

American Engrg Co, Aramingo Ave, Philadelphia, Pa.
Adv pages 12, 13
Bridgeport Chain & Mfg Co, Bridgeport, Conn.
Detroit Hoist & Machine Co, Detroit, Mich.
Gifford-Wood Co, 24 Hill St, Hudson, N. Y.
Lidgerwood Mfg Co, Elizabeth, N. J.
Link-Belt Co, 307 N Michigan Ave, Chicago, Ill.
Adv page 3
Markey Machinery Co, 85 Horton St, Seattle, Wash.
O K Clutch & Machine Co, Columbia, Pa.
Robins Conveying Belt Co, Passaic, N. J.
Adv page 188
Shaw-Box Crane & Hoist Div, Muskegon, Mich.
Shepard Niles Crane & Hoist Corp, 453 Schuyler Ave, Montour Falls, N. Y.
Stephens-Adamson Mfg Co, 5 Ridgeway Ave, Aurora, Ill.
Adv page 175
Wheeler, C H, Mfg Co, Lehigh & Sedgley Aves, Phila, Pa.

WIRE AND CABLE, ELECTRIC

Adam, Frank, Electric Co, Windsor Place, St. Louis, Mo.
American Steel & Wire Co, Rockefeller Bldg, Cleveland, Ohio
Anaconda Wire & Cable Co, 25 Broadway, New York, N. Y.
Chase Brass & Copper Co, 236 Grand St, Waterbury, Conn.
General Cable Corp, 420 Lexington Ave, New York, N. Y.
General Electric Co, Schenectady, N. Y.
Adv pages 32, 33
Graybar Electric Co, 420 Lexington Ave, New York, N. Y.
Adv pages 214, 234, 243, 261, 265, 282, 284
National Electric Products Corp, Fulton Bldg, Pittsburgh, Pa.
Phelps Dodge Copper Products Corp, 40 Wall, New York, N. Y.
Rockbestos Products Corp, New Haven, Conn.
Roebling's, John A, Sons Co, 640 S Broad St. Trenton N. J.
Simplex Wire & Cable Co, 66 Sidney St, Cambridge, Mass.
U. S. Rubber Co, 1230 6th Ave, New York, N. Y.
Willard Storage Battery Co, 246 E 131st St, Cleveland, Ohio

WIRE ROPE

(See Rope, Wire)

WIRES and CABLES

GraybaR QUALITY SINCE 1869 • REG. U.S. PAT. OFF. Everything Electrical . . . THAT IT TAKES TO WIN!

ONE ITEM OF THE GRAYBAR 60,000

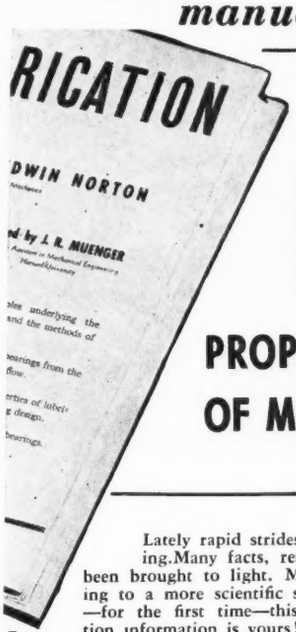
All types of wires and cables including Rubber-Covered, Braided and Leaded Wire, Varnished Cambric, Boiler Room Wire and Portable Cords.

DISTRIBUTED BY

GraybaR ELECTRIC COMPANY

IN OVER 80 PRINCIPAL CITIES

AT LAST . . . the lubricating manual of the year!



. . . bringing practicing engineers basic, up-to-date information on PROPER LUBRICATION OF MACHINE BEARINGS

Just Out!

Lately rapid strides have been made in the art of lubricating. Many facts, research findings, and developments have been brought to light. Many trails have been blazed, all leading to a more scientific solution of lubrication problems. NOW—for the first time—this great, valuable collection of lubrication information is yours! For in this new manual you are given full, last-minute data covering all the important advances and basic fundamentals in the rational design of machine bearings and in methods of lubricating them.

LUBRICATION

By ARTHUR E. NORTON
Late Gordon McKay Professor of Applied Mechanics, Harvard University

Edited by J. R. MUENGER
Formerly Assistant in Mechanical Engineering, Harvard University

243 pages, 6x9, 115 illustrations. $3.00

This is an authoritative manual that offers practicing engineers and others interested the basic information they need for a thorough understanding of machine bearing lubrication. The book develops the hydrodynamic theory for bearings from the simple concepts of viscosity and laminar flow, and discusses viscosity measurement, the properties of lubricants, and the practical considerations of bearing design. A useful comparison of plain bearings with rolling contact bearings is also made.

The book discusses the types of friction of interest in lubrication and gives criteria for bearings. A chapter is devoted to the properties of lubricants; and viscosity, its measurement and its variation with temperature, is treated at some length. Design practices, including grooving, bearing materials, and methods of applying lubricants are also clearly presented.

Get the facts in these chapters

1. Introduction
2. Fluid Friction and Viscosity
3. Thin-film Friction and Oiliness
4. Properties of Lubricants
5. Hydrodynamic Theory for Slider Bearings without Leakage
6. Slider Bearing with Variable Viscosity
7. Full Journal Bearing without Side Leakage
8. Partial Bearings and Fitted Bearings without Side Leakage
9. Slider Bearings with Side Leakage
10. Journal Bearings with Side Leakage
11. Thermal Equilibrium, Bearing Loads, and Design Practices
12. Grooving, Application of Lubricants, and Materials for Bearing Construction
13. Ball, Roller, and Needle Bearings

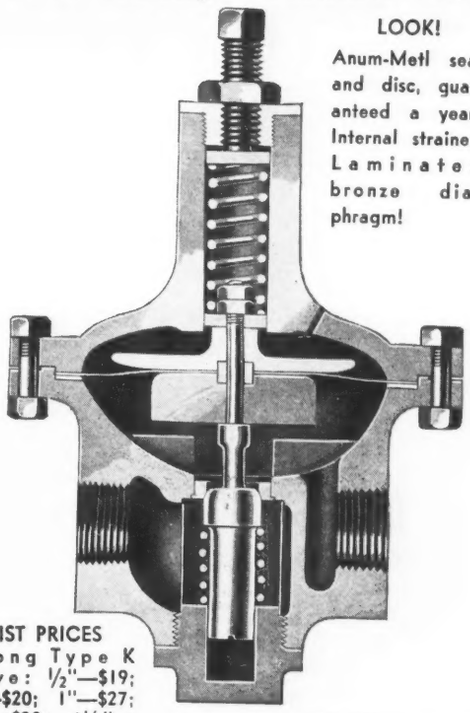
10 DAYS' FREE EXAMINATION

McGRAW-HILL BOOK CO., INC., 330 West 42nd Street, New York

Send me Norton—Lubrication for 10 days' examination on approval. In 10 days I will send you $3.00 plus few cents postage or return book postpaid. (Postage paid on cash orders.)

Name .....
Address .....
City and State .....
Position .....
Company .....P. 12-42

Single Seat and Disc, No Packing In This Husky STRONG Valve



LOOK!
Anum-Metl seat and disc, guaranteed a year! Internal strainer! Laminated bronze diaphragm!

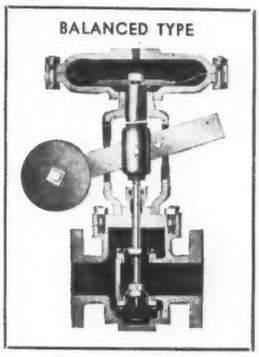
LIST PRICES
Strong Type K Valve: ½"—$19; ¾"—$20; 1"—$27; 1¼"—$38; 1½"—$42.

Name Your Reduced Pressure From 0 to 85 Pounds!

Here's the answer to accurate, low-cost pressure reduction! Strong's Type "K" Reducing Valve, with its Anum-Metl seat, internal strainer, and simple, self-contained mechanism is ideal for reducing power steam to pressures you can use for heaters, cookers, driers, etc.

Adjusting spring holds valve open until reduced pressure reaches point desired. Outlet pressure then raises diaphragm against action of spring, closing valve, and completing cycle.

Write about your pressure reducing problems or for Catalog 154-P11.



Strong Type "B"
For inlet pressure to 125 lbs., giving reduced pressure from 30 lbs. to 5 lbs. below atmosphere.

Strong, Carlisle & Hammond Company
1392 West Third St., Cleveland, O.

STRONG
STEAM SPECIALTIES

Answers to Today's Power Problems

To help you keep your plants running under overload conditions, to eliminate waste and to aid in maintenance, POWER offers these reprints of its Special Sections, designed for quick reading by the busy power engineer. The sections are concise handbooks on vital subjects, illustrated with diagrams, charts and tables to give you useful information in the shortest possible time.

1. FEEDWATER TREATMENT — This 32-page section, put back on the presses to supply the demand for information on this vital subject, presents a practical statement of problems, methods and practice, and shows how to avoid the costly consequences of shutdown due to scale, corrosion, carryover and embrittlement. . . . . **Price 25¢**

2. HEATING SYSTEMS—Covers controls, how to figure heat loads, operation and maintenance. Diagrams show hookups and construction details. 16 pages. **Price 15¢**

3. POWER FOR THE BATTLE OF PRODUCTION—48 pages of important power data includes 32 pages of information on the nation's power capacity, including latest census data, rates of power-equipment production, etc., plus 16 pages of steam-plant and hydro installations. In 3 colors on special paper stock. . . . . **Price 25¢**

4. FUELS— This section, "Fuels and Combustion", will give you practical data on how to get more out of your boilers. 32 pages of information on how to burn and buy fuels and how to figure combustion. . . . . **Price 25¢**

5. STEP UP STOKERS FOR WAR LOADS—8 pages of practical suggestions for increasing output of grate-fired boilers without extended shutdowns or heavy use of strategic materials. Of great value and use in meeting wartime operating problems . . . . . **Price 10¢**

6. POWER FOR DEFENSE—An aid to the power engineer faced with problems of rising loads and all-out production. 24 pages. . . . . **Price 20¢**

7. DIESELS — 16-page section in 2 colors, reprinted from June, 1941, POWER, shows how oil and gas engines work, covers engine performance, accessories, costs and lists of typical installations. . . . . **Price 20¢**

8. METERING FLOW—A 20-page handbook of flowmetering devices, their principles of design, operation and application, with many diagrams and charts. **Price 15¢**

For your convenience—

ORDER BY NUMBER ON COUPON BELOW

(12/42)

POWER,
330 West 42nd St.,
New York City, N. Y.

Please send me ..... copies of the following reprints, circled below. I enclose check ( ), money order ( ), for $.....

1 2 3 4 5 6 7 8

Name .....

Address .....

City .....

State .....

The Genuine for accessibility

Removal of two bolts frees the top cap—and the valve and seat are completely exposed to view.

Squires — STEAM TRAP —

The accessible Squires has become a byword among power plant operators.

Reliability and economy are among its popular points and besides Squires Traps positively will not wire draw.

The
C. E. Squires Co.
E. 40th St. and
Kelley Ave.
Cleveland, Ohio

Squires
TRADE MARK
Reg. U. S. Patent Office

May we send you
Catalog A-9

WEDGE Split CHILL RINGS
Save LABOR-MATERIAL-TIME

Split Feature Patented

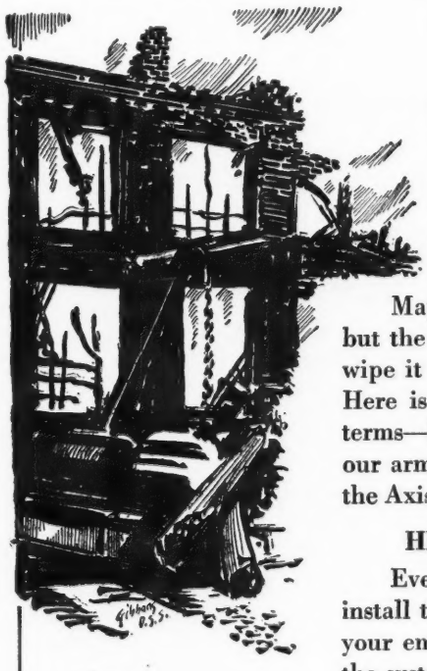
1 → SAVE LABOR
2 → SAVE MATERIAL
3 → SAVE TIME

Do you realize how useful WEDGE Chill Rings with the patented SPLIT Feature are for welding pipe? They save on all THREE factors vital for defense—LABOR, MATERIAL, TIME. In addition to the above mentioned advantages, you get STRONGER joints. WEDGE Chill Rings are successfully used by many Power Plants—why not see what they can do for you?

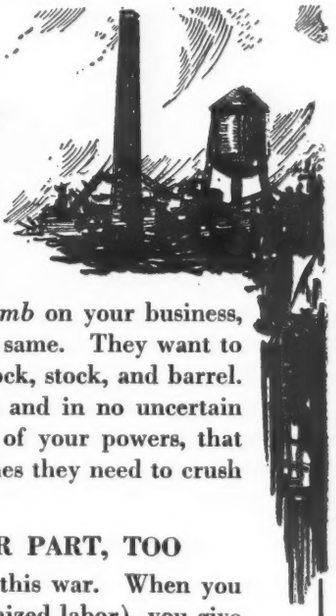
Write for Circular and Prices

WEDGE PROTECTORS, INC.
9524 Richmond Ave. Cleveland, Ohio

WEDGE CHILL RINGS SAVE MONEY



TARGET FOR TONIGHT
...*Your Business?*



Maybe they won't actually come and drop a *bomb* on your business, but the Axis war lords have their eye on it, just the same. They want to wipe it out as a competitive force—or take it over lock, stock, and barrel. Here is a threat that you can reply to *now*, today, and in no uncertain terms—by buying Defense Bonds to the very limit of your powers, that our armed forces may have the guns, tanks, and planes they need to crush the Axis *once and for all.*

HELP YOUR EMPLOYEES TO DO THEIR PART, TOO

Every American wants the chance to help win this war. When you install the Pay-Roll Savings Plan (approved by organized labor), you give your employees that chance. For details of the Plan, which provides for the systematic purchase of Defense Bonds by voluntary pay-roll allotments, write: Treasury Department, Section S, 709 12th St. NW., Washington, D. C.

Make Every Pay Day "BOND DAY"

Save with U. S. *Defense* BONDS ★ STAMPS

This space is a contribution to Victory by

POWER

PROFESSIONAL SERVICES

COLUMBIA ENGINEERING CORP.
STRUCTURAL, MECHANICAL & ELECTRICAL ENGINEERS
War Plant Design - Supervision of Construction - Engineering Reports
61 Broadway, New York, N. Y.
323 Plum Street, Cincinnati, Ohio

J. E. SIRRINE & COMPANY
Power Plants — Design — Water
Engineers
Consultation — Reports — Plans
Steam Utilization
Greenville, South Carolina

H. E. CORL
CONSULTING ENGINEER
Design Supervision of Construction Management
Industrial and Municipal Power Plants
Steam and Diesel
Steam and Electric Power Distribution Systems
Plant Surveys — Appraisals — Reports
1316 Arch Street, Philadelphia, Pa.

STANLEY ENGINEERING COMPANY
CONSULTING ENGINEERS
Power Plants
Steam - Diesel - Hydro
Design - Construction - Test - Valuation
Central State Bank Bldg., Muscatine, Ia.

HALL LABORATORIES, Inc.
R. E. HALL, Ph.D., Director
CONSULTANTS ON
BOILER WATER CONDITIONING
304 Ross St. Pittsburgh, Pa.

JOHN A. STEVENS, Inc.
Established 1909
CONSULTING ENGINEERS
Power Plants — Paper Mills
Dye Houses — Surveys
Lowell, Massachusetts

LANCASTER, ALLWINE & ROMMEL
Patents—Copyrights—Trade Marks
Booklets—General Information Concerning Inventions & Patents" and "Free Schedule" sent without obligation.
Established 1915
Suite 456, 815—15th St., N.W., Washington, D. C.

STONE & WEBSTER ENGINEERING CORPORATION
Design and Construction
Reports • Examinations • Appraisals
Consulting Engineering
BOSTON • NEW YORK • CHICAGO • HOUSTON
PITTSBURGH • SAN FRANCISCO • LOS ANGELES

J. H. MANNING & COMPANY
ENGINEERS
Business Studies, New Projects, Purchase-Sales, Management, Valuations, Reorganizations, Mergers, Public Utility Affair (including Integration)
120 Broadway, New York

THE J. G. WHITE ENGINEERING CORPORATION
ENGINEERS—CONSTRUCTORS
New York, N. Y.

SARGENT & LUNDY
ENGINEERS
140 South Dearborn St.
CHICAGO, ILLINOIS

NO TIME TO EXPERIMENT . . .
So why not save time by calling in a specialist who knows the ground you are exploring?

WHERE TO BUY

Featuring additional products and specialties for power plants

THE ORIGINAL
Tripp Metallic Packing
TRIPP METALLIC PACKING CO.
BOSTON MASS.

Can Money Be Saved in Your Plant?
The specialists whose professional cards appear in this Directory, can answer that question —*are* answering it continually for other power men.

When you WANT or OFFER

EMPLOYMENT
EQUIPMENT
(Used, or Surplus New)
PRODUCTS to Manufacture
CAPITAL
FACTORY SITES, etc.

Use the SEARCHLIGHT SECTIONS of

The following McGraw-Hill Publications to contact management, sales, engineering and operating executives in the industries they serve:

American Machinist
Aviation
Business Week
Bus Transportation
Chem. & Met. Engineering
Coal Age
Construction Methods
Electrical Contracting
Electrical Merchandising
Electrical World
Electronics
Engineering & Mining Journal
Engineering News-Record
E. & M. J. Markets
Factory Man. & Maintenance
Food Industries
Power
Product Engineering
Textile World
Transit Journal

"SEARCHLIGHT" is LOW-COST NATIONAL

Classified Advertising

Departmental Staff
McGRAW-HILL PUBLISHING CO., Inc.
330 W. 42nd St., New York City

REMOTE CONTROL

Sperry's
HYDRAULIC
"EXACTOR CONTROL"

assures
the smallest movement being
transmitted over long distances
without backlash
Installation simple, quick, economical

For use in Aviation, Marine & Industrial fields

RECEIVER

SINGLE TUBE REPLACES:
Cables, Turnbuckles
Pulleys, Bellcranks
Push Rods, etc.

TRANSMITTER

Standard on U. S. Army Air Corps Test Stands

SPERRY PRODUCTS, INC.
Hoboken, N. J.

NATIONAL
Classified Advertising —at your service

for bringing business needs or "opportunities" to the attention of men associated in administrative, executive, management, sales and responsible technical, engineering and operating capacities with the industries served by McGraw-Hill publications:

The SEARCHLIGHT SECTIONS *(Classified Advertising)* of

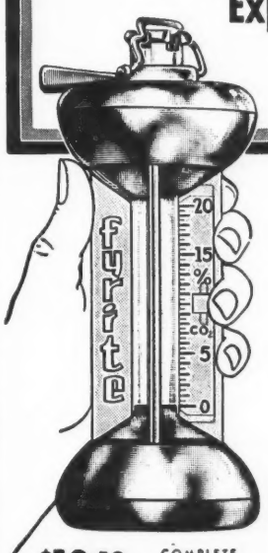
American Machinist
Aviation
Bus Transportation
Business Week
Chemical and Metallurgical Engineering
Coal Age
Construction Methods
Electrical Contracting
Electrical Merchandising
Electrical World
Electronics
Engineering News-Record
Engineering and Mining Journal
E & M J Markets
Factory Management and Maintenance
Food Industries
Power
Product Engineering
Textile World
Transit Journal

For advertising rates or other information address the Departmental Staff

McGRAW-HILL PUBLICATIONS
330 W. 42nd St., New York, N. Y.

FUEL is Vital for VICTORY

FYRITE CO_2 Readings Expose Fuel Waste *INSTANTLY!*



$18.50 COMPLETE WITH INDUSTRIAL TYPE FLUE FILTER

The amazingly simplified FYRITE "Orsat" Analyzer makes accurate flue gas tests easy—instantly telling you what percentage of your fuel is being wasted. The FYRITE is conveniently held in the hand while analysis is taken. It is accurate within ½ of 1% CO_2; spillproof in any position; rugged, durable, compact. More than 7000 in use.

RETURN COUPON BELOW. *Obtain literature on Fyrite and learn how to get immediate delivery under priority regulations.*

BACHARACH
Industrial Instrument Co.
7000 BENNETT ST.
PITTSBURGH, PA.

SEND DATA ON *FYRITE "ORSAT"*

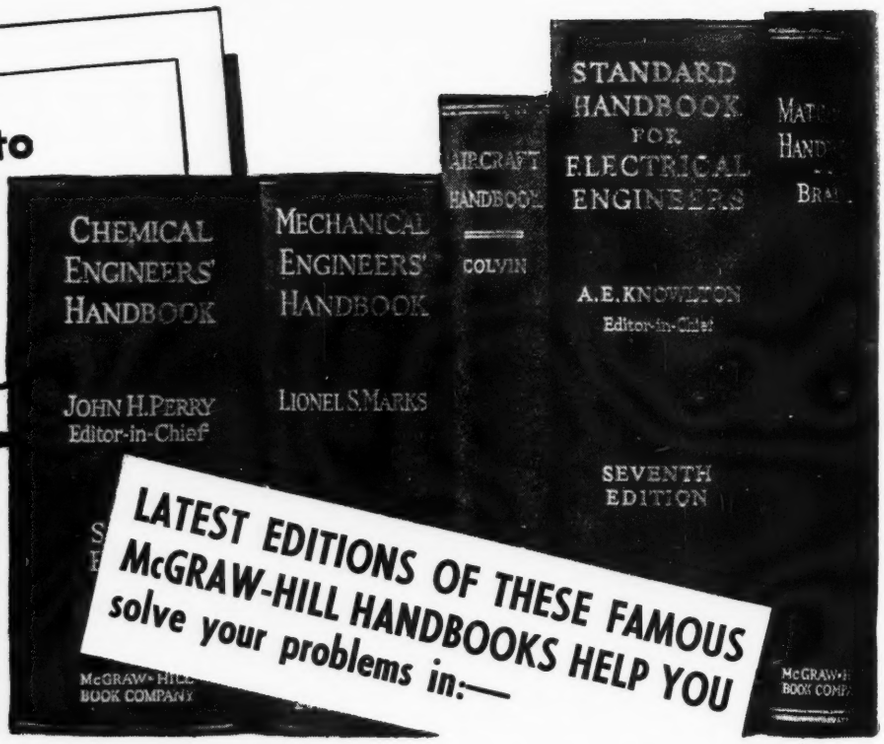
Name

Address

City State P

Special Offer to

TECHNICAL MEN:



Use any or all 5 of these great new handbooks 10 DAYS FREE

LATEST EDITIONS OF THESE FAMOUS McGRAW-HILL HANDBOOKS HELP YOU solve your problems in:—

- **aircraft maintenance work**
- **chemical engineering**
- **electrical engineering**
- **mechanical engineering**
- **materials selection**

1. STANDARD HANDBOOK FOR ELECTRICAL ENGINEERS

New Seventh Edition. The great standard reference work of all in the electrical engineering profession or whose work in industry or engineering touches this field. Presents a handy-reference compilation of practical, usable data from all fields of electrical engineering practice, plus the most frequently required fundamental theory, units, and systems of measurement, made dependable by the work of more than 100 authorities. Whole sections have been added; others rewritten or fully revised; new format incorporating larger page size, larger type, larger diagrams; improved from cover to cover to continue the Standard as the one indispensable reference tool of the electrical engineering profession. *Prepared by a staff of specialists. Archer E. Knowlton, Editor-in-Chief, Associate Editor for Engineering,* Electrical World. *2303 pp., 6x9, 1700 illustrations, 600 tables, thumb-indexed, $8.00.*

2. MECHANICAL ENGINEERS' HANDBOOK

New Fourth Edition. An all-round, up-to-the-minute tool for engineers. Gives you the thousands of facts in all branches of mechanical engineering that you need in your work, expertly treated and arranged for quick use. Covers every branch of the field, from aeronautics to mechanical refrigeration, from power generation to welding—with a profusion of concise descriptions of newest developments and trends, advances in practice, in theory, in systematization of machine elements, formulas, methods, tables, diagrams, fundamentals—all the most frequently needed standard data and practice. Here is the sort of material you might accumulate in years of experience and in many hours of reading professional books and articles—yours, ready for use, in one convenient volume. *Edited by Lionel S. Marks, Gordon McKay Professor of Mechanical Engineering, Emeritus, Harvard Univ. 2276 pp., 1700 illustrations, 800 tables, thumb-indexed, $7.00.*

3. CHEMICAL ENGINEERS' HANDBOOK

New Second Edition. A complete chemical engineering library in one volume—now thoroughly revised to meet current and pressing needs. Brings you the data needed in routine problems of design and practice and in investigation of special problems or branches of work. Concise descriptions and working fundamentals of processes and equipment are supplemented by a profusion of comprehensive formulas and equations, charts, tables, data, schematic diagrams, etc.—everything carefully selected for its practical application, arranged for quick reference to the essentials required by men in practical contact with chemical engineering problems of all types. *Prepared by a staff of specialists, John H. Perry, Editor; E. I. du Pont de Nemours & Co. 3029 pp., 1300 illustratioons, 1000 tables, $10.00.*

4. MATERIALS HANDBOOK

New Fourth Edition. An encyclopedia for purchasing agents, engineers, executives, and foremen. Presents the most important facts relating to a number of materials to enable you to make quick comparison, avoid checking many sources and remote possibilities, and quickly get a working knowledge of the best materials suited to a specific purpose. Covers 5000 materials — metals, alloys, organic materials, industrial chemicals, paints and finishing materials, molding materials, minerals, woods, and many others—with information on chief characteristics, comparative data, sources, substitutes, adulterants, and uses. A shortcut to accurate, essential facts needed in the selection and specification of materials. *By George S. Brady, formerly Managing Editor,* Product Engineering. *591 pp., 6x9, $5.00.*

5. AIRCRAFT HANDBOOK

New Fifth Edition. A comprehensive and authoritative manual for all concerned with aircraft maintenance, and others who need a detailed working knowledge of airplane engines and accessories. In a fully-illustrated, easy-to-understand treatment, its 20 sections present a wealth of practical information on everything from construction details of all types of engines to suggestions on the care of pontoons, from instructions for the complete assembly of engines to methods of splicing wires. Concentrates on the maintenance of engines and their accessories, adjustable propellers, and the most used airplane instruments. Includes data on landing gears, floats, and care of planes at terminals. Gives everything necessary to the intelligent performance of inspection, servicing, and repair work. *By Fred H. Colvin, Editor Emeritus,* American Machinist, *784 pp., 5½x8, 621 illustrations, 112 tables, $5.00.*

CHECK the books you want on this coupon

McGRAW-HILL EXAMINATION COUPON

McGRAW-HILL BOOK CO., INC., 330 W. 42nd Street, New York

Send me the books checked below for 10 days' examination on approval. In 10 days I will pay for the books, plus few cents postage, or return them postpaid. (We pay postage if you remit with order.)

- ☐ **Standard Handbook for Electrical Engineers, $8.00**
- ☐ **Colvin — Aircraft Handbook, $5.00**
- ☐ **Perry—Chemical Engineers' Handbook, $10.00**
- ☐ **Marks—Mechanical Engineers' Handbook, $7.00**
- ☐ **Brady—Materials Handbook, $5.00**

Name .....

Address ..... Position .....

City and State ..... Company ..... MP. 12-42

SEARCHLIGHT SECTION

EMPLOYMENT • BUSINESS • OPPORTUNITIES • EQUIPMENT—USED or RESALE

UNDISPLAYED RATE:

10 cents a word, minimum charge $2.00.

(See ¶ on Box Numbers.)

POSITIONS WANTED (full or part-time individual salaried employment only), ½ the above rates.

PROPOSALS, 50 cents a line an insertion.

INFORMATION:

BOX NUMBERS in care of any of our New York, Chicago or San Francisco offices count 10 words additional in undisplayed ads.

DISCOUNT of 10% if full payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals).

DISPLAYED—RATE PER INCH:

The advertising rate is $6.30 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.

AN ADVERTISING INCH is measured ⅞ inch vertically on one column, 3 columns—30 inches—to a page. P.

NEW ADVERTISEMENTS received by December 16th will appear in the January issue, subject to limitations of space available.

ARE YOU LOOKING FOR A LOCATION

FOR AN INDUSTRIAL OR BUSINESS PLANT?

COLUMBUS, NEBRASKA

The City of Power and Progress

Invites you to their city.

HOME OF THE 50,000 H.P. HYDRO ELECTRICAL PLANT.

Headquarters of Consumers Public Power District of Nebraska,

serving 300 communities at retail and 77 communities at wholesale.

SOME BUILDINGS AVAILABLE.

Write for particulars to

FORWARD COLUMBUS FUND, Box No. 5, Columbus, Nebr.

MOTOR REWINDS?

ARE YOU PARTICULAR?

DO YOU HAVE A SPECIAL MOTOR?

We stock only the Best of Insulation

100% Factory Work

TRY US

Previous Experience with

General Electric **Allis Chalmers**
Westinghouse **Navy Yard Work**

C. V. HUNT

Est. 1916

Ridgefield, N. J. Morsemere 6-5091

Trucks #1—U.S. Highway and Erie Railroad

POSITIONS VACANT

(See also "Selling Opportunity Offered")

ENGINEER (Licensed) required for day shift in an old established plant in Metropolitan New York City to supplement present staff. Permanent position. Oil burning equipment. Men now engaged on war work not considered. No age limit for experienced man physically capable. Excellent employee relations. Plant located convenient to good residential area. Give all details necessary to justify interview in letter of application. P-338, Power, 330 W. 42nd St., New York, N. Y.

WANTED—Watch Engineer and Fireman for outstanding municipally-owned electric generating plant. Two to five years experience in field and high school education, minimum requirements. Salary range $1980-$3000. State experience, draft status. Location Chicago Metropolitan Area. P-337, Power, 520 N. Michigan Ave., Chicago, Ill.

EMPLOYMENT SERVICE

SALARIED POSITIONS — $2,500 to $25,000. This advertisement service of 33 years' recognized standing negotiates for positions of calibre indicated. Procedure individualized to your personal requirements. Retaining fee protected by refund provision. Identity covered. If salary has been $2,500 or more send for details. R. W. Bixby, Inc., 270 Delward Bldg., Buffalo, N. Y.

POSITION WANTED

MECHANICAL ENGINEER, 11 years' experience in the applications of mechanical equipment for design of power plants, desires connection with engineering firm or manufacturer. PW-340, Power, 330 W. 42nd St., New York, N. Y.

SELLING OPPORTUNITIES

OFFERED—WANTED

Selling Agencies—Sales Executives

Salesmen—Additional Lines

OPPORTUNITY OFFERED

PROFITABLE SMALL EQUIPMENT side line now available for bituminous coal and stoker salesmen. Commission. Give details of territory covered. SW-321, Power, 330 W. 42nd St., New York, N. Y.

WANTED

ANYTHING within reason that is wanted in the field served by Power can be quickly located through bringing it to the attention of thousands of men whose interest is assured because this is the business paper they read.

WANTED

DESIGN ENGINEER—STEAM CONDENSERS

Knowledge of steam jet air pumps also of interest.

Reply in detail stating qualifications

P-339, Power

330 West 42nd Street, New York, N. Y.

OPERATING ENGINEERS—WANTED

Operating engineers who have or have had a Marine Engineers' License. Wages from $300 to $700 per month.

Apply

Local No. 33, M. E. B. A.

227 Fulton Street New York City

MECHANICAL ENGINEERS

and

DRAFTSMEN

Write or Apply in Person

ALUMINUM CO. OF AMERICA

PLANCOR PLANT

Postoffice Box 210 Massena, N. Y.

SUPERINTENDENT OF MAINTENANCE

For New Defense Plant

Must have thorough knowledge of high pressure boilers, vacuum and centrifugal pumps, and general chemical plant equipment. Electrical maintenance experience desirable. Must be able to handle men.

This is an excellent permanent position for an experienced, capable man. Cleveland, Ohio location. Give brief history in letter for appointment. Salary.

P-336, Power, 330 West 42nd St., New York City

Don't forget the

BOX NUMBER . . .

When answering the classified advertisements in this magazine, don't forget to put the box number on your envelope. It's our only means of identifying the advertisement you are answering.

W. L. SULLIVAN

*** MECHANICAL ENGINEERING ***

Also furnishing power plants, industrial, municipal and private, plants, designed, appraised or built, complete or parts, steam or other fuels, boilers, engines, pumps, machine and manufacturing plants also, new or used equipment.

P. O. BOX 236

Oklahoma City, Oklahoma

SALESMEN WANTED

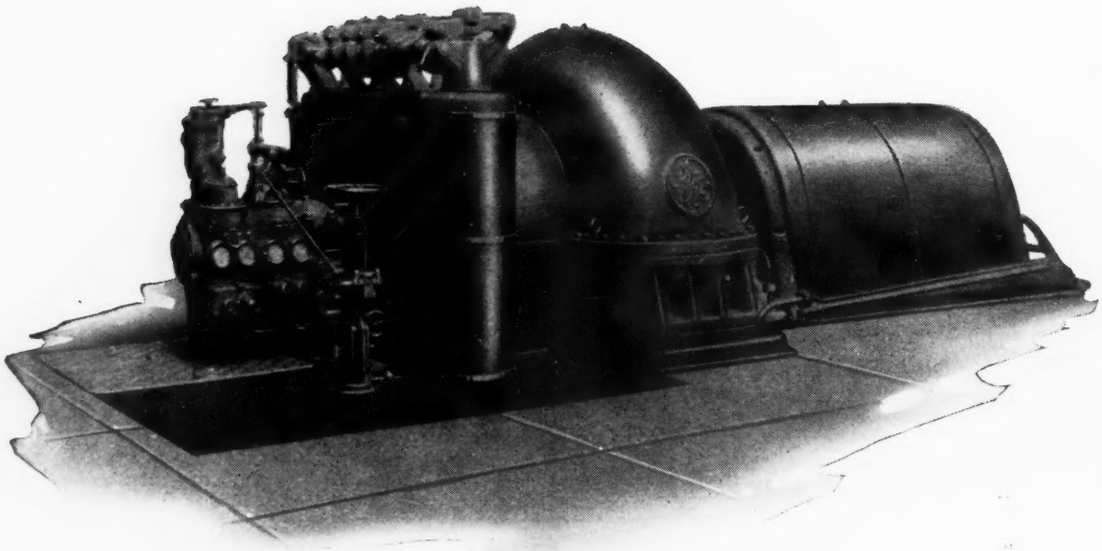
THERE is an opening in a few selected territories for an experienced salesman who has successfully sold services or intangibles. Technical experience not necessary. An American Citizen between the ages of 35 and 55, preferably married, who is able to meet and contact key executives in industry. Field training will be given the successful applicant and earnings should be $4,000 a year—the average of our present salesmen. One acquainted with the field served by this publication will find this connection a pleasant and profitable one. Our organization is an old, well-known concern with an excellent reputation. To learn more about this opportunity write full details to

SW 341, Power

330 West 42nd St., New York City

ELECTRICAL POW

SEARCHLIGHT SECTION



Actual Photograph

3125 KVA GENERAL ELECTRIC CONDENSING TURBO UNIT

3125 KVA General Electric Alternating current generator, 3 phase 60 cycle 2400/4160 volts 3600 RPM direct connected to General Electric condensing turbine 225-400 lbs. steam pressure 700 deg. TT. Equipped with surface condenser and auxiliaries.

ALTERNATING CURRENT TURBO GENERATORS

3 Phase 60 Cycle

9375 KVA GENERAL ELECTRIC condensing, 225 lbs. pressure, 100 deg. superheat, 1800 RPM with surface condenser; 4800 volts.

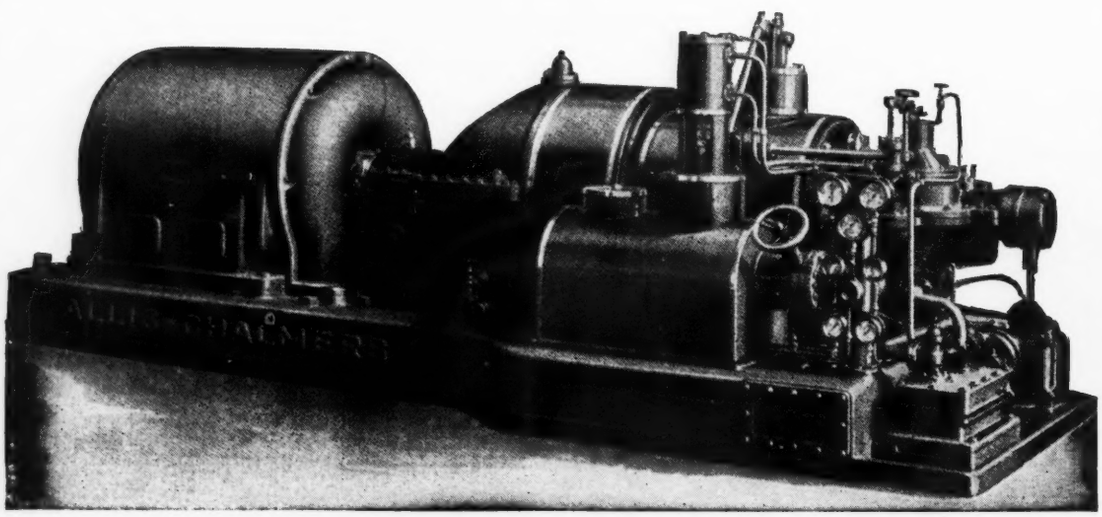
6250 KVA GENERAL ELECTRIC condensing, 220-225 lbs. pressure, 100 deg. superheat, 3600 RPM with jet condenser; 2300 volts.

3125 KVA GENERAL ELECTRIC condensing, 225-400 lbs. pressure, 700 deg. TT, 3600 RPM with surface condenser; 2300/4160 volts.

1250 KVA ALLIS CHALMERS condensing, 150-200 lbs. pressure, 100 deg. superheat, 3600 RPM with jet condenser; 2300 volts.

SURFACE CONDENSER

1540 sq. ft. WORTHINGTON surface condenser with steam jet air pumps.



Actual Photograph

1250 KVA ALLIS CHALMERS CONDENSING TURBO UNIT

1250 KVA Allis Chalmers alternating current generator 3 phase 60 cycle 2300 volts 3600 RPM direct connected to Allis Chalmers condensing turbine 150-200 lbs. steam pressure 100 deg. superheat. Equipped with jet condenser and auxiliaries.

DIRECT CURRENT ENGINE GENERATORS

125/250 Volts 3-Wire

150 KW CROCKER WHEELER—Ames 3 cylinder vertical Uniflow, 200-250 lbs. 0.8 lbs. back pressure, 360 RPM.

125 KW CROCKER WHEELER—Ames 3 cylinder vertical Uniflow, 200-250 lbs. 0.8 lbs. back pressure, 360 RPM.

ALTERNATING CURRENT ENGINE GENERATORS

3 Phase 60 Cycle

438 KVA GENERAL ELECTRIC - SKINNER uniflow, 125-150 lbs. steam pressure, 0-5 lbs. back pressure, 150 RPM; 2300-600-480-240 volts

210 KVA GENERAL ELECTRIC - SKINNER uniflow, 120-150 lbs. steam pressure 0-3 lbs. back pressure, 225 RPM; 2300-600-480-240 volts

210 KVA GENERAL ELECTRIC, 2300-600-480-240 volts, 225 RPM (GENERATOR ONLY)

THE NATIONAL POWER

ER EQUIPMENT

ROTARY CONVERTERS

60 Cycle

3500 KW (2) WESTINGHOUSE, 225-285 volts D.C., 225 RPM with 3 phase 60 cycle 13200 volt transformers.

2500 KW WESTINGHOUSE, 600 volts D.C., 400 RPM with 3 phase 60 cycle 11000 volt transformers.

1500 KW WESTINGHOUSE, 225-285 volts D.C., 450 RPM with 3 phase 60 cycle 2300/4000-6900/12000 volt transformers.

1000 KW WESTINGHOUSE, 600 volts D.C. 900 RPM with 3 phase 60 cycle 4000 volt transformers

750 KW GENERAL ELECTRIC, 600 volts D.C., 1200 RPM with 3 phase 60 cycle 2300/4000 volt transformers.

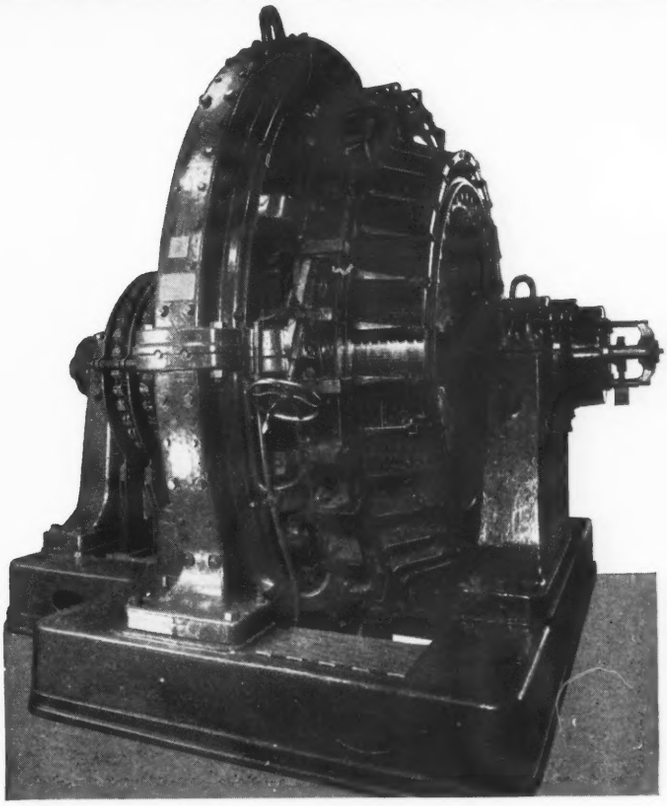
500 KW (2) WESTINGHOUSE, 600 volts D.C., 1200 RPM with 3 phase 60 cycle 6600-445/222 volt transformers.

ROTARY CONVERTERS

25 Cycle

1500 KW WESTINGHOUSE,, 600 volts D.C., 500 RPM with 3 phase 25 cycle 11000 volt transformers.

3500 KW (2) Westinghouse booster type interpole, rotary converters, 225-285 volts D.C. 225 RPM; 6 phase 60 cycle A.C. with 3 phase 60 cycle 13,200 volt transformers. Complete with control.

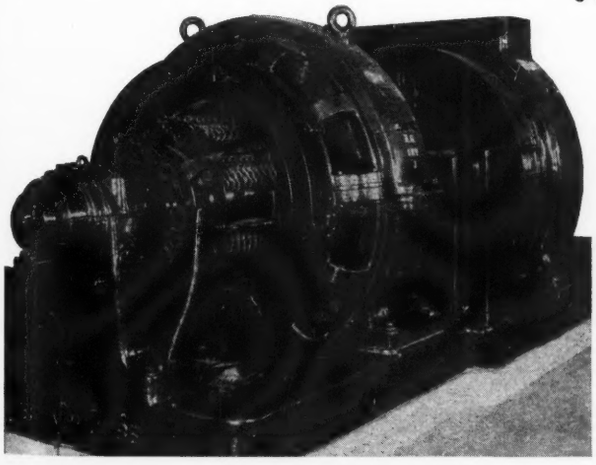


Actual Photograph

3500 KW WESTINGHOUSE ROTARY CONVERTER

MOTOR GENERATOR SETS

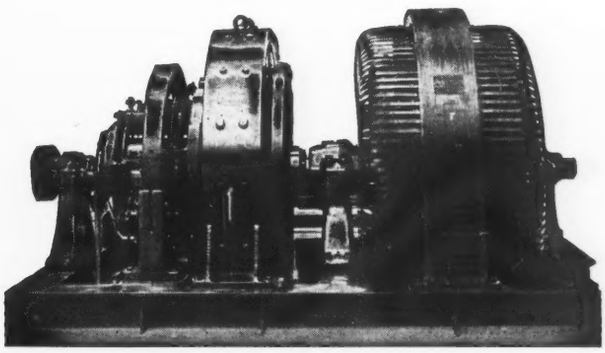
3 Phase 60 Cycle



Actual Photograph

1000 KW WESTINGHOUSE MOTOR GENERATOR SET

1000 KW (1500 KW 2 hrs. 55 deg. C rise) WESTINGHOUSE direct current generator 125/250 volts 3-wire 720 RPM direct connected to 1427 HP 80% P.F. (2140 HP 2 hrs. 55 deg. C rise) WESTINGHOUSE synchronous motor 3 phase 60 cycle 2300 volts 720 RPM. Equipped with D.C. control panel and starting equipment.



Actual Photograph

1000 KW GENERAL ELECTRIC MOTOR GENERATOR SET

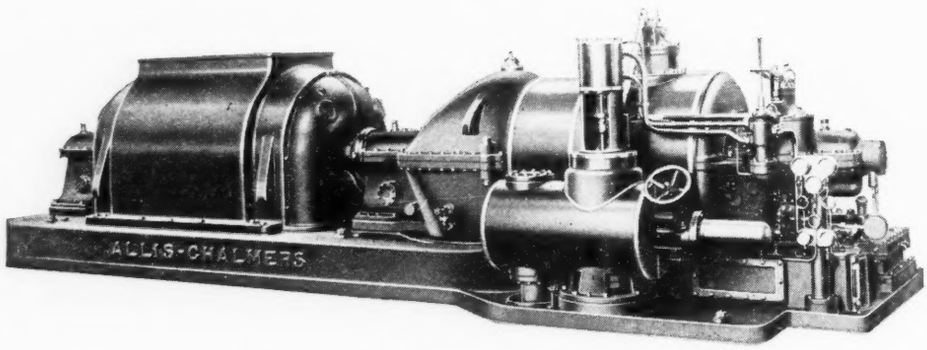
1000 KW (1250 KW 2 hrs. 55 deg. C rises) GENERAL ELECTRIC direct current generator 125/250 volts 3-wire 720 RPM direct connected to 1400 HP 80% P.F. (1750 HP 2 hours 55 deg. C rise) GENERAL ELECTRIC synchronous motor 3 phase 60 cycle 13200/6600 volts 720 RPM. Equipped with D.C. breakers.

MACHINERY CO. 1921 SCRANTON RD. CLEVELAND, OHIO

DEPENDABLE

Turbo-Generators

It is the Practice of this Company to Confine its Inventory Strictly to Comparatively Modern, Little Used Turbines Some Are Practically New



2—Allis-Chalmers, 2500-KVA, 3/60/2300-volt, 200#-P, 500°F-TT, Surface Condensers

PART OF OUR INVENTORY—BELOW

1—Westinghouse 6250-KVA, 3/60/2300-v, 200# 500°F. TT. Surface Condenser.

1—Allis-Chalmers 4000-KVA, 3/60/2300-v, 200#, 500°F, TT, Condensing.

1—G.E., 2500-KVA, 3/60/600-v, 200# 500°F. TT. Condensing.

1—G.E., 1563-KVA, 3/60/2300v, 175#, 100° SH, 28". Surface Condenser.

1—General Electric 1563 KVA Non-condensing 3/60/600 volts 150#.

1—Westinghouse 1000—KW, 250-volt, Direct Current, Condensing, 150/250# pressure. Surface Condenser.

1—Allis-Chalmers 1250-KVA, 3/60/2300-v, 200#, 500° TT. Surface Condenser.

1—G.E., 1250-KVA, 3/60/480-v, 175#-P and 16# Abso. Mixed Pressure.

1—937 KVA Non-Condensing 3/60/480 Volts 400# gauge 100°F superheat.

1—G.E., 937-KVA, 3/60/2300v, 200#, 500°-TT, 3-Stage Condensing.

1—Allis-Chalmers, 937-KVA, 3/60/2300-v, 200#, 500°-TT, Condensing Surface Condenser.

1—G.E., 625-KVA, 3/60/2300-v, 200# 500° TT. Condensing.

1—G.E., 625-KVA, 3/60/600-v, 250#, 550°F-TT, Condensing Modern.

1—General Electric 250 KVA Non-Condensing 3/60/480 Volts, 140#

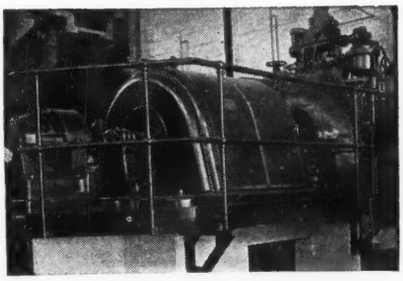
WILMS, WEAVER & CO. Penobscot Building DETROIT, MICH.

We Deal in Turbo-Generators Exclusively

Bring on your "PRIORITIES"... bring on your INSPECTORS!

Hemphill

"HEMPHILL" EQUIPMENT IS READY— welcomes your closest examination . .



MOTORS GENERATOR SETS

1—75 KW, 125 volt, GE, sq. cg.
1—20 KW, 600 volt, GE, sq. cg.
1—15 KW, 250 volt, GE, sq. cg.

D. C. GENERATORS

1—75 KW, 675 RPM, 125 volt, Westinghouse.
1—75 KW, 260 RPM, 250 volt, Westinghouse.
1—75 KW, 675 RPM, 125 volt, Westinghouse.

MOTORS—3 PHASE 60 CYCLE

1—720 HP, 360 RPM, 440 volt, G.E., syn.
1—500 HP, 1200 RPM, 440 volt, GE, syn.
1—400 HP, 514 RPM, 440 volt, Westg., slip ring.
1—350 HP, 100 RPM, 220/440 volt, G.E. syn.
1—335 HP, 600 RPM, 2300 volt, G.E. syn.
1—300 HP, 720 RPM, 2200 volt, G.E., Sl Rg.
1—250 HP, 514 RPM, 4000 volt, G.E., syn.
1—250 HP, 600 RPM, 4000 volt, G.E. Sync.
1—200 HP, 900 RPM, 440 volt, Westg., sl. rg.
1—200 HP, 600 RPM, 2200 volt, G.E., sl. rg.
1—200 HP, 450 RPM 2200/4000 v., G.E., sl. rg.
1—150 HP, 1800 RPM, 2300 volt, Al. Ch. sq. cg.
1—150 HP, 1800 RPM, 440 volt, West. Sq. Cg.
1—150 HP, 900 RPM, 440 volt, Al. Ch. sl. rg.
1—150 HP, 720 RPM, 440 volt, G.E., slip ring.
1—150 HP, 600 RPM, 440 volt, G.E., slip ring.
1—150 HP, 400 RPM, 440 volt, G.E., sq. cg.
2—125 HP, 720 RPM, 440 volt, G.E., slip ring.
1—100 HP, 1800 RPM 440 volt, Westinghouse sq. cg.
1—100 HP, 900 RPM, 440, Westinghouse, sq. cg.
1—100 HP, 900 RPM, 440 volt, G.E., slip ring.
3—100 HP, 720 RPM, 440 volt, G.E., slip ring.
1—100 HP, 720 RPM, 440 volt, G.E., sq. cg.
1—100 HP, 600 RPM, 440 volt, G. E., slip ring.
1—100 HP, 600 RPM, 440 volt, G.E., sq. cg.
1—100 HP, 514 RPM., 440 volt G.E. sq. cg.
2—100 HP, 450 RPM, 440 volt, G.E., sq. cg.
1—90 HP, 400 RPM, 550 volt, Crocker Wheeler sq. cg.
1—75 HP, 900 RPM, 4000 volt, Elec. Mach. syn.
1—75 HP, 900 RPM, 220 volt, Fairbanks, Morse, slip ring.
1—75 HP, 900 RPM, 440 volt, GE, sq. cg.
1—75 HP, 720 RPM, 440 volt, Westghse, slip ring.
1—75 HP, 720 RPM, 440 volt, GE, sq. cg.
1—50 HP, 900 RPM, 440 volt, GE, slip ring.
1—50 HP, 900 RPM, 440 volt, GE, sq. cg.

MOTORS—D. C. 230 VOLTS

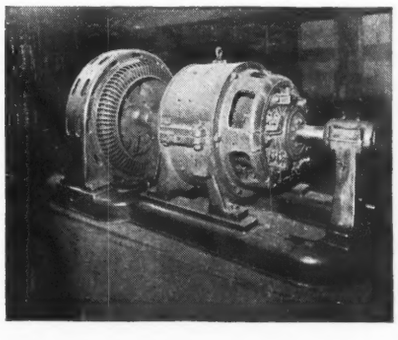
1—250 HP, 760 RPM, Electro Dynamic.
1—150 HP, 750 RPM, Electro Dynamic.
1—125 HP, 600 RPM, Westinghouse, SK.
1—100 HP, G.E. 575 RPM
1—100 HP, 625 RPM, G.E.
1—90 HP, 900 RPM, GE.
1—75 HP, 950 RPM, GE.
1—65 HP, 1000 RPM, G.E., type RC.
1—50 HP, 750 RPM, Westinghouse, type SK.
1—50 HP, 700 RPM, Crocker Wheeler.
1—40 HP, 775 RPM, Westinghouse.
1—40 HP, 300 RPM, General Electric
1—30 HP, 750 RPM, G.E., type RC.

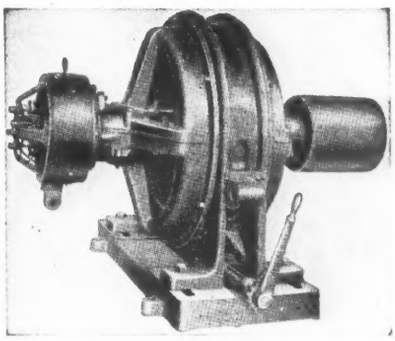
MOTORS—VARIABLE SPEED 230 VOLTS

2—100 HP, 475/1375 RPM, Electro Dynamic
1—90 HP, 470/940 RPM, General Electric.
1—75 HP, 525/1575 RPM, Electro Dynamic.
1—60 HP, 600/1200 RPM, General Electric.
1—35 HP, 500/1500 RPM, Westinghouse.
1—35 HP, 350/1050 RPM, Electro Dynamic.
1—30 HP, 225/900 RPM, Crocker Wheeler.
2—25 HP, 300/900 RPM, Electro Dynamic.
1—20 HP, 750/1500 RPM, General Electric.
1—15 HP, 300/1200 RPM, GE.
1—13/18 HP, 350/1200 RPM, Electro Dynamic
1—5 HP, 600/1200 RPM, General Electric.
1—5 HP, 450/1800 RPM, Crocker Wheeler.
1—5 HP, 400/1600 RPM, Diehl.
1—5 HP, 225/900 RPM, Electro Dynamic.

ALTERNATORS

1—625 KVA, 3600 RPM, 600 volt, G.E.
1—400 KVA, 400 RPM, 240 volt, Westg.
1—250 KVA, 720 RPM, 230 volt, G E.
1—200 KVA, 3600 RPM, 240 volt, Allis Chal.
1—62½ KVA, 3600 RPM, 220 volt, Allis Chalmers.





TURBO-GENERATORS

2—1000 KW, 3 ph., 60 cy., 2300/4150 v., cond.
1—500 KW, G.E., 3 ph., 60 cy., 480 volt, bleeder.
1—375 KVA, Westinghouse, non-condensing.
1—300 KW, G.E., 3 ph., 60 cy., 220 v. cond.
1—200 KW, G.E., 3 ph., 60 cy., 220 volt, cond.

TRANSFORMERS

2—400 KVA, G.E., 4156-240/480 v., Scott taps.
3—300 KVA, Pittsburgh, 7800/440 volts.
3—250 KVA, Westinghouse, 5500/440 volts.
2—200 KVA, GE, 2300/4600-230/460 volts, Scott taps.
1—200 KVA, Pittsburgh, 7800-110/220 volts.
3—150 KVA, G.E., 33,000-2300/4000 Y.
1—150 KVA, GE, 2400-120/240 volts.
3—100 KVA, Westinghouse, 11,430/250 volts.
1—100 KVA, Pittsburgh, 1375/2750-110/220 volts.
1—100 KVA, GE, 2200-110/220 volts.
3—100 KVA, Westinghouse, 13200 250 volts.
3—75 KVA, GE, 13,500-7500/440 volts.
1—75 KVA, GE, 3 phase, 4156Y-120/208Y.
1—75 KVA, Pittsburgh, 7600-110/220 volts.
3—50 KVA, Wagner, 4150-220 volts.
2—50 KVA, Pbgh, 7500/15,000 volts-110/220 volts.
4—37½ KVA, 2200-220/110 v.
7—25 KVA, Westg., air cooled, 440/220-110 v.
1—25 KVA, GE., 220/110-220/110 volts.
2—15 KVA, G.E., 2300-115/-230 volts.
4—10 KVA G.E., 2300-115/230 volts.
3—7½ KVA, G.E., 440-110/220 volts.

OIL CIRCUIT BREAKERS

1—3000 amp., 15,000 v., 3 pole, G.E., type FK-130.
1—3000 amp., 600 v., 4 pole G.E. type FK-24
1—1600 amp. 7500 v., 4 pole Westg., B-2.
1—1200 amp., 15000 v., 4 pole, Westg., B-2.
Also complete stock of small sizes.

IT'S "HEMPHILL" for POWER EQUIPMENT

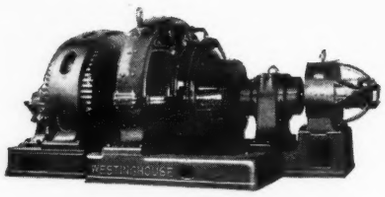
J. L. HEMPHILL & CO. PHONES
1602 53rd STREET, NORTH BERGEN, N.J.
NEW YORK: LOngacre 5-3227
NEW JERSEY: UNion 3-2600

POWER EQUIPMENT

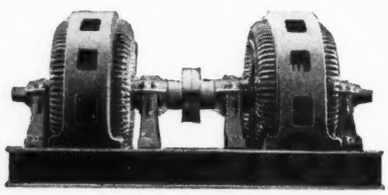
REBUILT BY CHICAGO ELECTRIC

Now—with war work reaching an all time high, more and more manufacturers are finding that the ideal solution to power equipment shortages lies in the use of rebuilt equipment . . . Chicago Electric Rebuilts are again proving their worth by matching the performance of similar units purchased new. Because of this, more and more wartime manufacturers are investigating the possibility of filling their equipment needs with Chicago Electric Guaranteed Rebuilt Power Equipment . . . it's completely rebuilt and guaranteed to perform "same as new."

- GENERATORS
- AC AND DC MOTORS
- AIR COMPRESSORS
- MOTOR GENERATORS
- SWITCHBOARDS
- TURBO GENERATORS
- PLATING GENERATORS
- WELDING GENERATORS
- TRANSFORMERS
- REPAIRING
- REWINDING
- RENTAL



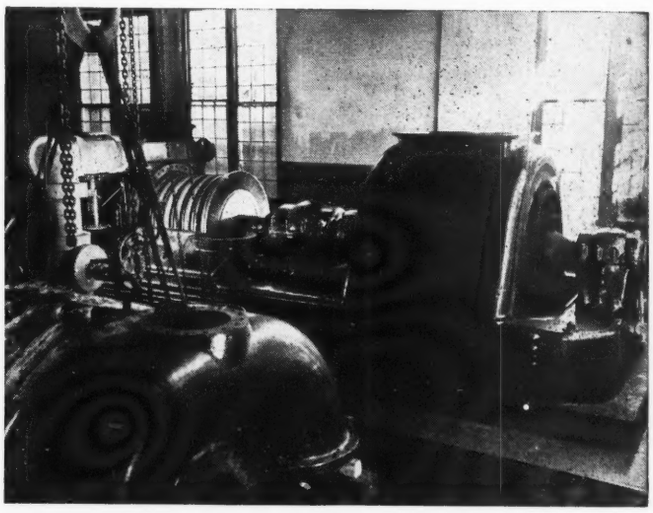
The above 750 KW Westinghouse Motor Generator Set and a "Twin" unit were rebuilt by Chicago Electric Company for use in a large Ohio manufacturing plant.



1000 KVA Motor Generator Set designed and assembled for power factor correction of welding load in a large Steel Mill. This generator serves a battery of 39-25 KVA Spot Welders . . . Base designed and built in our own shops.

SINGLE MOTORS OR COMPLETE POWER PLANTS

CHICAGO ELECTRIC COMPANY
1320 WEST 22nd STREET • • • CHICAGO, ILLINOIS



7500 Kw Condensing Turbo-Alternator

7500 KW 80% Curtis General Electric 6-stage Reaction Pattern Condensing Turbo (in record log service performing at 10/11000 KW.) Unit is 60/3/5000/1800 RPM/200# 150° Superheat (has been operated standardly under 250# ISP). Steel steam chest and throttle valve; generator mica insulated. Standard operating temperature rated 40°C. Wheeler Surface Condenser equipped.

CONDITION: In personal disassembly inspection accompanied by parent experts, recently completed, the fact of quality almost equal to new has been verified.

TURBOS—60 cycles

15000 KW performance 40° Impulse and Reaction Semi-Double Flow Condensing unit with non-automatic bleeder facility, 200# design (approved and adaptable with slight changes for 400# and non-automatic in max. volume at either 100# or 65# GPB (single parallel theory for 2300 volts). Surface Condenser and all auxiliaries complete. "In RANGE".

4000 KVA Allis-Parsons design Turbo 60/3/4150 volts Star (perhaps regroupable standard theory 2300 volts Delta). Original design Condensing and operated at 5000 KW for short period, then altered for NC heating by-process load after removal of 4 rows LP blades (would require new blading for condensing). Now Surface Condenser equipped with all standard auxiliaries.

2000 KW rated Allis-Parsons (approx. 3000 KW normal) 60/3/440, no Condenser (would operate efficiently at approx. rated log NC plan at approx. 18# GP).

2000 KW GE Curtis 6-stage Reaction design 60/3/2300/1800 RPM Condensing and Non-Automatic Bleeder, Surface Condenser equipped. Has log record of 2600 KW constant at 40°. Total log service record 8000 hours (approved non-automatic bleeder theory 30,000# 20# BP. 1800/2000 KW performance.

2000 KW Westinghouse Reaction design 60/3/2300/1800 RPM. Now Barometric Condenser equipped. Officially approved for NC plan at minimum 1500 KW 18# BP. Operators vouch for first-class condition thruout.

TURBOS—25 cycles

25 Cycle Condensing turbos of total approx. capacity of 30/40,000 KW 25/3 various standard voltages. Surface Condensers. Short actual log and first-class condition.

WATER TUBE BOILERS

1400 HP 650# 200° SUPERHEATER EPUIPPED BENT TUBE STOKER DESIGNED UNIT EQUIVALENT BRAND NEW.

6-1050 HP LONGITUDINAL DRUM TYPE BOX STEEL HEADER 200# 150° SUPERHEAT, CHAIN GRATE STOKER EQUIPPED. RECENT SPECIAL DISASSEMBLY INSPECTION APPROVED FOR 200# RE-ERECTION. COMPLETE BOILER PLANT LAYOUT.

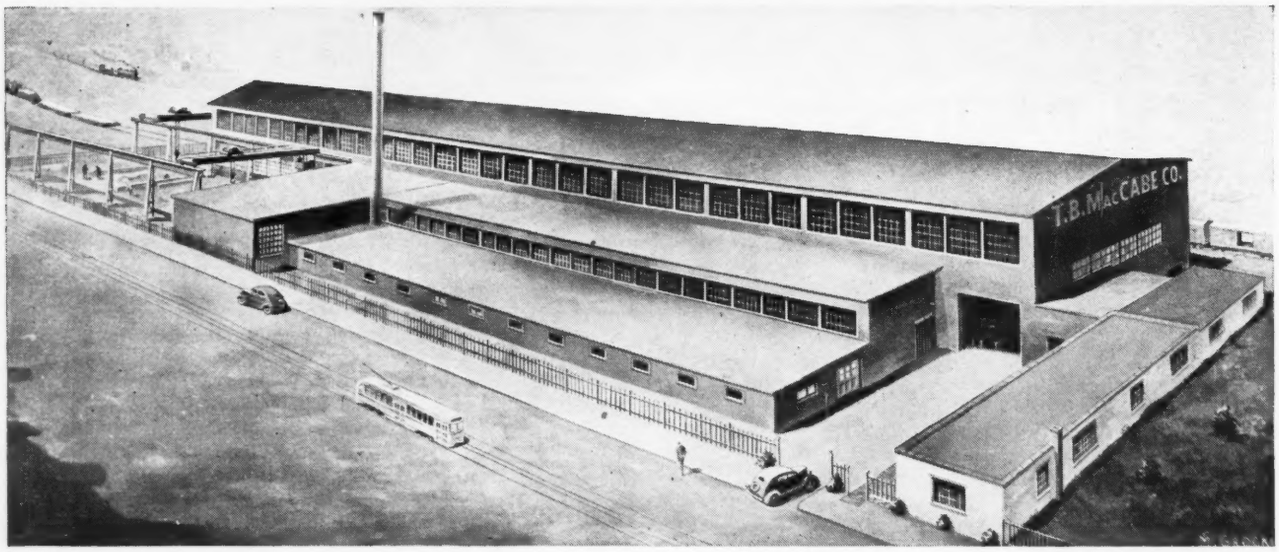
3-525 HP BOX STEEL HEADER CROSS DRUM 200# ASME INSPECTED AND PASSED CHAIN GRATE STOKERS, ALL PLANT PIPING, CONSIDERABLE AUXILIARIES.

8-400 HP B&W STIRLINGS POWDERED COAL EQUIPPED, SUPERHEATERS, WATER COOLED WALLS AND AIR-COOLED SIDE WALLS, SOOT BLOWERS, COAL AND ASH HANDLING, FORCED DRAFT FANS, FEED WATER HEATERS, METERS, GAUGES, ETC. COMPLETE 3200 HP BOILER PLANT, STEEL BUILDING CAPABLE OF DISMANTLING, ETC. SHORT LOG SERVICE. 200# ASME IDENTIFIED, APPROVED IN RECENT INSPECTION. COMPLETE BOILER PLANT LAYOUT.

4-500 HP B&W Sectional Header 200#, Chain Grate Stokers.

Approximately 12 smaller straight tube and bent Tube Boilers 200# of 350/500 HP.

PIONEER PERSONAL SERVICE COOPERATION IN HEAVY POWER THRU THREE WARS—1892 - 1942 IN INTEGRITY OF PLAN AND PERFORMANCE



WE OPERATE THE LARGEST PLANT IN THE COUNTRY

given over to exclusive rebuilding of cranes and allied lines, crane and mill electrical equipment, and now have one department on electrical equipment only.

(Send us your inquiries for all kinds of electrical equipment.)

OVERHEAD ELECTRIC TRAVELING CRANES

Tons	Make	Span	Current
(2) - 1	Maris	35′ 7″	230-VDC. FL. OP
(2) - 1½	Euclid	30′ 0″	115/230-VDC. FL. OP.
(1) - 2	P & H	34′ 8″	230-VDC. CG. OP.
(2) - 3	Sprague	20′ 6″	115/230-VDC. FL. OP.
(2) - 3	Armington	12′ 4″	230-VDC. CG. OP.
(Sprague & Armington Cranes Underslung Type with Overhang			
(1) - 5	Shepard Niles	30′ 0″	230-VDC.
(1) - 5	Cleveland	34′ 3″	230-VDC.
(1) - 10	Whiting	32′ 0″	220-V-3-PH-60-CY.
(1) - 10/5	P & H	80′ 0″	230-VDC.
(1) - 20	P & H	50′ 0″	230-VDC.
(1) - 25/5	P & H	80′ 0″	230-VDC.
(1) - 40	P & H	50′ 0″	230-VDC.

230-VDC. CRANE & MILL MOTORS

	H.P.	Make	Type	R.P.M.
(1)	1	P & H	5¼ x 3½	850
(1)	2½	G.E.	C.O. 2502	800
(1)	3½	G.E.	C.O. 2503	800
(1)	2	Shaw	B.E.	930
(1)	2½	Reliance	T	1600
(8)	2¼	Westgshe	K-1	835
(3)	6	G.E.	C.O. 1805	1150
(2)	7½	Westgshe	MT-000	
(1)	8	Shaw	Z-#62	640
(1)	10¾	C.W.	#6-K	810
(9)	20/30	G.E.	M.D. 104	725/575
(2)	19	Westgshe	K-5	550
(14)	30/45	G.E.	M.D. 104½	625/500
(2)	50	Shaw	Z	550
(2)	50	G.E.	C.O. 1810	550
(1)	60	Westgshe	K-10	470
(3)	65/85	G.E.	C.O. 1830	700/650
(2)	55/65	Westgshe	MCA-#60	550
(2)	65/85	G.E.	C.O. 1811	700/550
(1)	60/80	G.E.	M.D. 106	550/475
		(With Back Axle Brackets)		
(1)	100	G.E.	C.O. 1812	700
(1)	150	Westgshe	MCB	365

COMPLETE RESISTORS & DRUM CONTROLLERS WITH ABOVE G.E.M.D. MOTORS, ALSO 75 E.C.&M. DINKY, C.H., G.E., & WESTGSHE DRUM CONTROLLERS IN STOCK 5 to 100-HP.

ELECTRIC TRAVELING GANTRY CRANES

(1) - 3-ton Milwaukee 3-motor, A.C. or D.C., 31′ 3″ span, 13′ 3″ overhang each side.

(1) - 15/5-ton McMyler, 4-motors, A.C. or D.C., 80′ 0″ span, 35′ 0″ lift.

(1) - 50-ton Morgan, 5-motors, (2 - 25-ton trolleys), 60′ 0″ span, 50′ 0″ overhang each end.

GENERAL PURPOSES 230-VDC. MOTORS

	H.P.	Make	Type	Speed
(2)	2	Allis Chalmers	#50 DE	1750
(1)	3	Reliance	T-224	3500
(1)	3	G.E.	RLC-111	500/1500
(4)	5	Westgshe	SK-#40	850
(1)	5	Westgshe	SK-#33	1150/1650
(3)	7½	Westgshe	SK-83 & 103	400/1600
(4)	7½	Westgshe	SK-#60	850
(1)	7½	Westgshe (110-V)	SK-#40	1150
(1)	8	Westgshe	SK-100	300/1200
(1)	10	Westgshe	SK-50	1300
(2)	10	Westgshe	SK-70	850
(1)	10	Westgshe	SK	400/1600
(1)	15	Reliance	23-OT	300/1200
(1)	25	Westgshe	SK	1100
(1)	70 (New)	Reliance	46-I.T.	600/1200
		(New E. C. & M. Auto. Panel)		

SLIP RING MOTORS

	H.P.	Make	Type	Current
(2)	5	G.E.	MTC-5200	220/3/60
(1)	5	G.E.	MTC-5201	220/3/25
(1)	15	G.E.	ITC-5008	220)3/60
(2)	15	G.E.	ITC-5009	220/3/60
(1)	15	G.E.	MTC-5302	440/3/60
(3)	22	G.E.	ITC-5009	220/3/60
(2)	22	G.E.	ITC-5010	220/3/60
(1)	25	G.E.	MQC-5526	220/2/60
(1)	25	Westgshe	C.I.	220/2/60
(2)	35	Westgshe	C.I.	220/2/60
(2)	37	G.E.	ITC-5011-A	220/3/25
(1)	40	G.E.	ITC-5012	220/3/60
(1)	52	G.E.	ITC-5013	220/3/60

(Many of these equipped with Electric Brakes. We can furnish Drum Type Controllers from Stock.)

T. B. MacCABE COMPANY, 4306 CLARISSA ST. PHILADELPHIA, PA.

REBUILT POWER EQUIPMENT

READY TO SHIP!

ROTARY CONVERTERS

2—200 kw. G.E. 275 v. 900 rpm., 6 ph. 60 cy. complete with overspeed device and transformers.
2—500 kw. G.E. type HC-8 600 volt, 900 rpm., 6 ph., 60 cy. pedestal bearing with overspeed device complete with transformers.

MOTOR GENERATOR SETS

200 kw. Westinghouse 600 v. D.C. 600 rpm., dir. con. 2200/3/60 Syn. Motor Complete.
1—150 kw. Westinghouse 250 v. 600 rpm., dir. con. 2200/3/60 syn. motor.
125 kw. Crocker Wheeler 250 V. D.C. 1200 rpm., 220/440 v., 3 ph. 60 cy. induction
100 kw. G.E. 550 v. 900 rpm. dir. con. 2200/3/60 Syn. Motor.
1—75 kw. G.E. 250 v. 900 rpm., dir. con. 2300/3/60 Syn. Motor.

ENGINE GENERATOR SETS

225 kw. Elec. Machy. 2200 or 220 v. 2 ph. 60 cy. dir. con. Ideal Steam
1—225 kw. Elec. Machy. 2200/220 or 440 v. 3 ph. 60 cy., 200 rpm., dir. con. Ideal Engine 4 valve non-releasing.

100 HP. LIDGERWOOD HOIST

Double drum Speedwell 2500 lb. pull at 450' per min. direct driven by 100 hp. A.C. or D.C. Motor.

CHAIN HOISTS

30—2 ton Yale & Towne complete with 3 ton trolleys.

A.C. GENERATORS

219 kva. G.E. 2300/3/60 200 rpm, 80% P.F. (Can be reconnected 440 or 220 v.)
2—120 kw. G.E. 220/440 v. 3 ph. 60 cy. 900 rpm., 80% P.F.

GAS ENGINE GENERATOR SET

75 kw. West. 250 v. belted to 110 HP 2 cyl. Bessemer Gas Engine.

SLIPRING MOTORS—3 ph. 60 cy.

No.	HP	Make	Type	Volts	rpm.
1	1500	Allis Chal.	ANY	2200	485
1	700	G.E.	MT-432	2200	393
1	400	West.	CW	2200/550/220	435
1	400	West.	CW-967A	220/440	1170
1	300	G.E.	I-M	220/440	600
1	260	Burke	EMV-65	220/440	600
3	250	G.E.	I-M	550	600
3	250	G.E.	I-M	2200/220/440	600
3	200	G.E.	I-M	2200/220/440	600
1	200	G.E.	I-M	2200	514
1	150	G.E.	I-M	220/440	900
1	100	West.	C?	220/440	1750
1	100	G.E.	I-M-16	2200	450
2	100	West.	CW	2200	580
1	75	West.	CW	220	875
1	60	West.	HF	2200	690
1	60	Triumph	C-16	220/440	430
2	60	G.E.	MT-536	2200	1150
1	53	G.E.	I-M	220/550	1165
1	52	G.E.	ITC-5013	220/440	570
2	50	Allis Chal.	ANY	220/440	900
1	50	West.	HF-12A	220/440	900
1	50	West.	CW-461	220/440	900
1	50	G.E.		220/440	850
2	50	West.	HF	220/440	1120
1	50	West.	CW-636A	220/440	1150
2	40	G.E.	MT-332	220/440	1155
1	40	G.E.	MTC-5522	220/440	1125
1	40	G.E.	MT-342	220/440	860
1	40	Allis Chal.		220/440	685
1	40	G.E.	MT-552	220/440	575

SERIES MOTORS—230 v.

1—175 HP G.E. type MD-109¼ 475 rpm.
5— 75 HP G.E. type 211 550 rpm.
1— 68 HP G.E. CO-2007, 475 rpm.
1— 50 HP Shaw.
1— 50 HP West. K-10 (500 v.) 435 rpm.
1— 30 HP G.E. CO-2002, 610 rpm.
1— 15 HP Crocker Wheeler 270 rpm.
6— 2 HP Reliance, 850 rpm.

SYNCHRONOUS MOTORS

2—125 kw. G.E. type ATB, 220/440 v. 3 ph. 60 cy. 900 rpm., 80% PF.

SPEED REDUCERS

1—3 HP. Farrell Herringbone double reduction ratio 6 to 1.
1—5 HP. Boston single reduction ratio 9.25 to 1.
17—8 HP. Tate Jones worm gear 36 to 1 ratio.
3—10 HP. D.O. James spur gear 840 to 30 rpm.
7—10 HP. Horsburg double reduction ratio 6 to 1.
2—20 HP. Sturtevant ratio 14.5 to 1.
5—60 HP. Poole Eng. Co. 5½ to 1 ratio.
1—150 HP. Falk Co. ratio 7.31 to 1.
1—450 HP. Kerr Reduction 3800 to 720 rpm.
1—150 HP. R.D. Nuttal ratio 1.6 to 1.

TRANSFORMERS—1 ph. 60 cy.

3—1500 Kva. Pittsburgh Transformers, 22,000 volt Primary, 6900/6600/2200 volt secondary.

No.	Kva.	Pri.	Sec.	Make	Ph.
1	250	2300		G.E.	
3	150	22000	6900	Pgh.	
1	150	2200	230/460	G.E.	3 ph.
1	100	2200	110/220	G.E.	
3	100	6600	550/440/220	Pgh.	
2	75	2200	220	Burke	3 ph
2	60	440	220/110	West.	
2	50	2300	220/440	G.E.	1 ph.
3	50	11430/6600	550	Al. Ch.	
3	50	6600	575	G.E.	
1	50	2200	220	Burke	
3	50	2200	110/220	West.	
5	50	2200	110/220	G.E.	
1	37½	2300	220/440	Wagner	
3	37	4400	185	West.(Rotary)	
1	30	2200	110/220	G.E.	
2	30	440	220/110	West.	
25	25	2200	110/220	G.E.	
1	25	550	110/220	G.E.	1 ph.
3	25	2200	110/220	Westg.	1 ph.
3	20	2200	110/220	G.E.	
1	20	1100/2200	110/220	Pgh.	1 ph.
10	15	2200	110/220	G.E.	
3	15	2300	220/440	Pgh.	
3	15	2300	220/440	Pgh.	1 ph.
35	10	2200	110/220	G.E.	
40	10	2200	110/220	West.	
100	7½	2200	110/220	G.E.	
50	7½	2200	110/220	West.	
75	5	2200	110/220	G.E.	
50	5	2200	110/220	West.	

AIR COMPRESSORS

2—260 CFM Chic. Pneu. 12x10, 100# pres. 285 rpm. belt driven by 40 HP G.E. AC slipring Motors.

SQUIRREL CAGE MOTORS—3 ph. 60 cy.

HP	Volts	Make	Type	Speed
500	2200/440/220	West.	CS	720
400	2200/440/220	West.	CS	500
450	2200/440/220	West.	CS	600
400	2200/440/220	West.	CS	600
350	2200/440/220	West.	CS	450
300	2200/440/220	West.	CS	400
250	220/550	G.E.	I-K	720
225	2200/440/220	G.E.	TRE	200
200	220/550	G.E.	I-K	514
200	220/550	G.E.	I-K	600
200	440	G.E.	I-K	720
200	2200/440/220	West.	CS	250
200	220/440	West.	CS	580
200	2200	West.	CS	870
150	550/220/440	G.E.	—	575
150	220/550	G.E.	I-K	450
150	220/440/550	G.E.	I-K	514
125	220/550	G.E.	I-K	850
125	440	G.E.	I-K	514
125	440	G.E.	I-K	450
125	220/550	G.E.	I-K	400
125	440	G.E.	I-K	720

Qu.	HP	Volts	Make	type	Speed
1	75	220/440	Wagner		1750
2	60	220/440	Cr.Wh.		670
3	60	220/440	Allis Cha with speed reducers		1150 1150 to 209 rpm.
7	50	220/440	Wagner		850
2	15/30	220/440	West	MS	550/1100
25	7½	220/440	Cr.Wh.		675
30	5	220/440	Cr.Wh.		1140
6	5	220/440	G.E.	vert.	1150
8	3	220/440	Cr.Wh.		850
25	2	220/440	Cr.Wh.		685
29	1½	220/440	Ilg		490
4	1	220/440	West	geared	44
25	1/2	220/440	Cr.Wh. with speed reducers		840

ELEVATOR

1—Westinghouse Elevator, traction type, 3000 lbs. Cap., platform 6x5, 2 gates on car, 4 sets of bi-parting doors, planed steel tees for main guides complete with AC motor and constant pressure control. All automatic.

INDUSTRIAL TRUCKS

3—Elwell Parker Tow Tractors 7' L. x 42" W. x 42" H. 4-16" wheels, ball bearing, 4 wheel steer, 4 wheel drive, 2000# DBP complete with Edison Batteries.
2—Yale & Towne Elec. Lift Trucks 54" lift, 4000# cap. 27" prongs, with or without batteries.
1—Yale & Towne Elec. Lift Truck 50" lift.
1—Baker Tow Truck 8'1x64"hx48" w. complete with Ready Power Unit.
100—small steel trucks with oak platforms 42"x24" heighth 17" with 4—12" roller bearing wheels and 5th wheels including handles.

SCALES

6—Fair. Morse #11½ 3 beams (2—200# ea. 1—50 lbs.) platform 16¼x21⅝.
9—Howe Scales 3 beams—platform 14½x22.

★ *FOR VICTORY TODAY AND SOUND BUSINESS TOMORROW— BUY WAR SAVINGS BONDS* ★

WRITE, WIRE OR PHONE YOUR ELECTRICAL REQUIREMENTS

DUQUESNE ELECTRIC & MFG. CO.

PITTSBURGH, PA.

SUCCESSFUL OPERATION GUARANTEED

Every Machine in This Ad is Owned Outright By Us

D C MOTORS

230 Volt—Constant Speed

	HP	Make	Type	Speed
2—	625	G.E.	MPC	130
1—	250	Al. Ch.		525
2—	200	Whse.	SK	400
1—	200	G.E.	DMC	475
1—	150	G.E.	MPC	275
1—	140	G.E.	MDS-108	410
1—	125	G.E.	CDP-123	1750
1—	300	G.E.	MPC	250/400

230 Volt—Adjustable Speed

1—	600	Whse.		150/275
1—	300	G.E.	MPC	275/550
1—	200	Whse.		400/500
1—	150	G.E.	MPC	250/450
3—	150	Whse.	SK-201	300/900
1—	100	Al. Ch.		950/1150

DC MOTORS—Special

	HP	Make	Type	Volts	Speed
1—	1500	Whse.	Interpole	550	330
3—	1250	G.E.	MPC	500	130
1—	270	Whse.	Interpole	500	250/400
3—	130	Cr. Wh.	50H	500	1200

TRANSFORMERS

	KVA	Make	PH	Type	Voltages
1—	1500	Whse.	3	OISC	26400/13200x460
3—	1000	G.E.	1	HKDD	13800x2300
2—	300	G.E.	1	H	13200x2300/575
2—	200	Whse.	1	SK	6900x230/460
3—	200	G.E.	1	H	26400x115/460
3—	100	Whse.	1	OISC	13200x

GEAR UNITS

1—2100 HP Whse., 1800/375 RPM
1—943 HP GE 5306/1200 RPM
1—720 HP DeLaval 3600/600 RPM

MOTOR GENERATOR SETS

3 ph. 60 cycle

1—1500 KW GE 600 V. DC, Gen. d.c. to 2100 HP—6600 V. Syn. Motor with exciter.
1—500 KW GE 600 V. DC Gen. d.c. to 700 HP—13200 V. Syn. Motor with Exciter.
1—500 KW Whse., 250 V. DC Gen. d.c. to 700 HP—2300/6600 V. Syn. Motor with Exciter.

TURBO GENERATOR SET

1—500 KW, Whse. 625 Kva., 440 V., 3 ph., 60 cy., 3600 RPM with Parsons 145/175 lb. condensing turbine complete with jet condenser and accessories.
1—500 KW, G.E., 625 KVA, 2300 v., 3 ph., 60 cy. generator with Curtis 4 stage, 150 pound condensing turbine complete with condenser, etc.

ROTARY CONVERTERS

60 Cycle

1—1500 KW, Whse. 720 RPM 650 v. DC with 3-single phase, 33000 v. transforms and panel.
1—1250 KW G.E. 720 RPM 250 V. DC with 1375 KVA, 3 ph., 2300 V. Transformers and Panels.
2—750 KW Whse. 1200 RPM, 600 V. DC with 2300/6600/11,000 volts Transformers and Panels.
1—750 KW Whse. 720 RPM 250 v. DC with three phase 6600/2300 v. transformer and panels.
1—375 KW Whse. 1200 RPM 250/275 V. DC with 2200/6600 V. Transformers and Panels.
1—300 KW, G.E., type HCC, 1200 RPM., D.C., 600 V. AC. 6 ph., 13200 v. Trans.

25 Cycle

3—1500 KW GE 225/275 v. DC Booster type each with 1600 KVA, 3 ph. 6765 volt transformers and panels.
1—500 KW GE 225/275 DC Booster type with 500 Kva 3 ph. 6765 volt transformer and panels.

A C MOTORS

3 phase—60 cycles

Synchronous

	HP	Make	Type	Volts	Speed
1—	500	G.E.	TS	440	360
1—	430	G.E.	ATI	2300	720
1—	250	G.E.	ATI	220	450
1—	200	Whse.		440	514
3—	150	G.E.	TRB	220x440	450
1—	150	Whse.	G	2300	900
1—	150	Whse.		2200/550	1800
1—	125	G.E.	ATI	240	257

Slip Ring

1—	800	Al. Ch.		440	88
1—	600	G.E.	IM	2200	90
1—	450	Whse.	CW	2200	870
1—	400	G.E.	MT	550/440	300
1—	400	Al. Ch.		2300	505
1—	400	Al. Ch.		440	1200
1—	350	G.E.	IM	2300/4000	257
1—	300	G.E.	IM	2300	585
1—	250	G.E.	MT-410	2300	400
1—	250	G.E.	MT	4000/2300	257
2—	200	Whse.	CW	2200	514

Squirrel Cage

1—	500	G.E.	1-17B	2200	695
1—	300	Whse.	CS	550	580
2—	300	G.E.	1K	2300	600
1—	300	Al. Ch.		2200	1160
1—	250	Al. Ch.		220/440	1150

SINE WAVE SET

Main unit—GE 3 unit, 4 Brg. consisting of motor—15/35 HP. 750/1800 RPM, 230 V. DC Gen—15 KW—220/110 V., 1800 RPM—3 ph., 60 cy.
Ref. Gen.—5 KW—36/18 V., 1800 RPM, 3 ph., 60 cy., with stator shifting.
Complete with Exciter Set, Voltage regulator, panels and accessories.

RE-NU-BILT BELYEA MOTORS

What are your requirements? units up to 5000 kw available in stock.

BELYEA COMPANY INC.

Main Office & Shop: 43 HOWELL ST., JERSEY CITY, N. J.

Large Quantity Small and Medium Size Motors for Immediate Shipment

230 VOLT DC

Quan.	HP	Make	Type	Speed
5	½	West	SK	1750
2	1	West	SK	1150
5	1½	Rel.	T	500/1000
1	2	West	SK	1150
2	2	GE	RC	1750
2	2	GE	BD	1750
3	2	West	SK	850
8	2	C.W.	CCM	1150
10	2½	GE	RLC	500/1000
1	3	Star		1750
1	3	GE	RC	1750
2	3	West	SK	1150
5	3	West	SK	850

Quan.	HP	Make	Type	Speed
5	3	Roth		500/1000
1	5	West	SK	1750
2	5	GE	RC	1150
1	5	West	SK	400/1600
10	5	West	SK	850
12	7½	C.W.	CCM	850
3	7½	West	SK	850
3	7½	West	SK	1750
1	7½	GE	CD	1750
2	7½	GE	RC	1150
4	7½	GE	RC	850
1	10	GE	RC	1800
1	10	West	SK	1325

Quan.	HP	Make	Type	Speed
6	15	Rel	T	850
1	15	West	SK	1150
2	15	West	SK	850
7	15	GE	RC	850
1	20	Rel	T	825
1	20	West	SK	850
1	25	West	S	650
1	30	AC		575
1	35	GE	LC	650
1	40	AC		950/1150
3	50	West	SK	565
1	100	Rel	T	500

220/440 VOLT AC—SQUIRREL CAGE

Quan.	HP	Make	Speed
13	1	Wag.	1200
1	1½	Cent.	900
5	3	Imp.	3600
1	3	Rel	1200
1	3	C.W.	1200
2	5	GE	1200

Quan.	HP	Make	Speed
1	5	West	1800
3	5	GE	3600
2	15	Cent	1200
1	15	Wag	900
5	15	Rel	900
1	20	U.S.	720
1	20	West	1200

Quan.	HP	Make	Speed
3	20	Rel	900
2	30	Rel	1200
1	30	Wag	720
1	40	Rel	900
1	50	Wag	600
1	50	GE	1800

220/440 VOLT—SLIP RING

Quan.	HP	Make	Speed
1	30	GE	900

550 VOLT—SLIP RING

Quan.	HP	Make	Speed
2	15	GE	900
1	25	GE	900

SYNCHRONOUS

2— 75 HP GE with direct conn. Exciters—220 V, 900 rpm
1—268 HP GE with belted Exciter—2300 V. 600 rpm

2300 VOLT—SQUIRREL CAGE

Quan.	HP	Make	Speed
3	100	GE	720
3	75	GE	900

Quan.	HP	Make	Speed
4	75	GE	720
2	60	GE	900

Quan.	HP	Make	Speed
2	50	GE	900
2	35	GE	900

TRANSFORMERS — MOTORS — TURBINES — GENERATORS — STEAM ENGINES — BOILERS

HEAT AND POWER COMPANY, INC.

45 BOND ST. **Algonquin 4-3874** **NEW YORK CITY, N. Y.**

Late Type 500 KW Westinghouse Syn. Motor Generator Set

Motor—714 HP 3 ph. 60 cycle 4100 Volts 900 RPM 80% PF 900 RPM

Generator—500 KW 250/125 Volts 2000 Amps 900 RPM. Complete with Manual AC & DC Controls

35 KVA West. MG Set Motor:—40/90 HP. Type SK 230V, 800/1800 RPM

Generator:—35 KVA 3 ph., 40/90 cy. 115 volts, 800/1800 RPM. Late type Factory built.

150 KW General Electric, 250 volts motor generator set, 900 RPM, 3 phase, 60 cycle, 2300 volts.

SYNCHRONOUS MOTORS

200 H.P. G.E.—TS—514 RPM.
55 H.P. Elec. Machy., 1200 RPM.

SLIPRING MOTORS

250 H.P. G.E., 600 RPM.
200 H.P. G.E., 720 RPM.
200 H.P. G.E., 514 RPM.
125 H.P. Burke, 600 RPM.
75 H.P. West., 1200 RPM. (5).
64 H.P. G.E., 585 RPM.
60 H.P. West., 1200 RPM.
60 H.P. West., 290 RPM.
(180 additional slipring motors, 1 to 50 H.P. in stock.)

SQUIRREL CAGE MOTORS

200 H.P. G.E., 600 RPM.
150 H.P. G.E., 600 RPM.
75 H.P. Burke, 1200 RPM.
60 H.P. G.E., 1800 RPM.
50 H.P. Allis Ch., 720 RPM.
50 H.P. G.E., 720 RPM.
50 H.P. G.E., 600 RPM.
(310 additional squirrel cage motors in stock, 1/4 to 50 H.P.)

A.C. GENERATORS

150 KW G.E., 720 RPM.
100 KVA Cr.Wheeler, 900 RPM.
100 KVA West., 600 RPM.
90 KVA G.E., 900 RPM.

230 VOLTS D.C. MOTOR GEN. SETS

125 KW Curtis, steam turbine dr.
150 KW G.E. 900 RPM.
25 KW G.E., 1750 RPM.
(18 additional sets in stock, 1 to 25 KW.)

125 V. MOTOR GEN. SETS

90 KW G.E.
75 KW Ridgway Syn. 1200 RPM.
(19 additional 125 V. M.G. Sets in stock, 1/2 to 25 KW.)

550 VOLT D.C. MOTORS

25 H.P. G.E., 875 RPM.
20 H.P. G.E., 895 RPM.
15 H.P. G.E., 2100 RPM. (2).
15 H.P. G.E., 1350 RPM.
7½ H.P. G.E., 900 RPM.
5 H.P. West., 1100 RPM
3 H.P. G.E., 1800 RPM.
(12 additional motors in stock, 1/4 H.P. up.)

230 VOLT D.C. MOTORS

165 H.P. Cr. Wheeler, 670 RPM.
125 West. 1750 RPM.
100 H.P. Reliance, 1150 RPM. (2).
60 H.P. G.E., 1050 RPM.
60 H.P. G.E., 900 RPM.
60 H.P. Roth, 600 RPM.
50 H.P. G.E., 850 RPM.

230 VOLT D.C. MOTORS

40 H.P. El. Dyn., 1450/2600 RPM.
40 H.P. G.E., 1700 RPM.
40 H.P. Allis Ch., 1150 RPM.
40 H.P. Reliance, 625 RPM.
35 H.P. Ridgway, 300/800 RPM.
40 H.P. G.E., 440/800 RPM.
30 H.P. West., 500/1500 RPM.
25 H.P. G.E., 1150 RPM. (3).
25 H.P. West., 850 RPM. (2).
25 H.P. G.E., 575 RPM.
20 H.P. G.E., 1750 RPM.
(235 additional motors, 1/2 to 20 H.P. in stock.)

115 VOLT D.C. MOTORS

90 H.P. G.E., 900 RPM.
65 H.P. G.E., 550 RPM.
20 H.P. Sprague, 1250 RPM.
15 H.P. G.E., 1150 RPM.
10 H.P. L.A., 3600 RPM.
10 H.P. F.-M., 1150 RPM.
10 H.P. West., 850 RPM.
7½ H.P. G.E., 1750 RPM.
7½ H.P. West., 1150 RPM.
7½ H.P. G.E., 850 RPM.
(215 additional 115 volt D.C. Motors, 1/2 to 5 H.P., also in stock.)

MISCELLANEOUS

5 H.P. B & D 230 volt buffer.
40—A.C. & D.C. Fans and Blowers
11—Motor Driven Freq. Changers 90 to 180 cycles.
14x10 Ing. Rand. Compressor, 503 ft. at 60 lbs. pressure.
12½x12 American Compressor, 390 ft. at 125 lbs. pressure.
2—Triplex Pumps.

L. J.

LAND

AND COMPANY

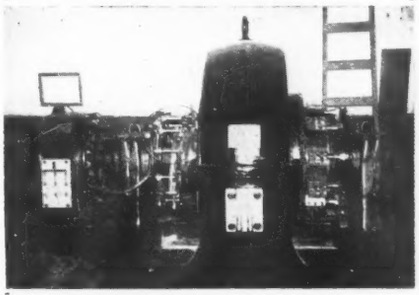
NEW YORK, N. Y.: 146 GRAND ST.
READING, PA.: 10TH AND EXETER STS.
New York City's largest stock Electrical Equipment

ONE YEAR GUARANTEE

We are actively in the market to purchase your surplus or idle electrical machinery.

OVER QUARTER CENTURY SERVING INDUSTRY

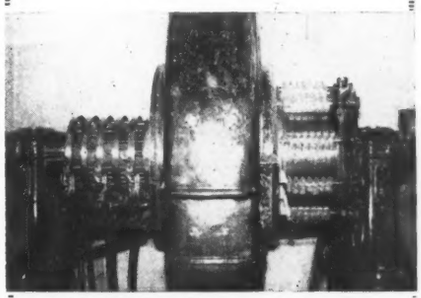
CONVERTERS



400 KW Rotary Converter

Code SEA 805 — 2—WESTINGHOUSE ROTARY CONVERTERS, 400 KW, D.C. E.M.F., 550/600 volt, 3 phase, 720 RPM, from 440 volt, A.C. With type C Westinghouse constant speed induction motor.

SEA 803 — 1—GENERAL ELECTRIC SYNCHRONOUS CONVERTER, 500 KW, D.C., type HCC, 600 volt, 1,200 RPM, from 440 volt, A.C.



500 KW Synchronous Converter

Code SEA 804 — 1—GENERAL ELECTRIC SYNCHRONOUS CONVERTER, 500 KW, D.C., 650 volt, 720 RPM, 60 cycle, from 440 volt, A.C.

LA 160 — 7—DUPLEX ROTARY CONVERTERS (G.E.) 1,500 KW-750 KW, 13,200 volt, 3 phase, 25 cycle, 500 RPM, to 1,300-650 volt, D.C.

Dulien Steel Products, Inc.

414 First Avenue South
SEATTLE, WASH.

SAN FRANCISCO—NEW YORK
LOS ANGELES—NEW ORLEANS
PORTLAND—BUTTE

DIESEL ENGINES

READY FOR IMMEDIATE SHIPMENT

2—450 H.P. Wintons, 8 cylinder, 4 cycle, 225 RPM, direct reversing.
2—300 H.P. Bessemers, 8 cylinders, 4 cycle, 650 RPM, direct reversing. With Steel Hull.
240 H.P. Superior, 6 cylinder, 4 cycle, 500 RPM.
240 H.P. Fairbanks-Morse, 4 cylinder, 250 RPM, direct reversing.
200 H.P. Fairbanks-Morse, 4 cylinder, 2 cycle, 257 RPM.
150 H.P. Fairbanks-Morse, 6 cylinder, 400 RPM, direct reversing.
150 H.P. Buda, 6 cylinder, 4 cycle, 900 RPM.
2—150 H.P. Wintons, 6 cylinder, 400 RPM, direct reversing.
2—140 H.P. Fairbanks-Morse, 4 cylinder, 400 RPM, direct reversing.
200 H.P. McIntosh-Seymour Diesel 135 K.W. D.C. Generator Set.
180 H.P. Worthington Diesel 100 K.V.A. Generator Set.
35 K.W. Hercules Diesel Generator Set, A.C.
25 K.W. Winton Diesel Generator Set, D.C.

A. T. METTLER
151 Washington St. Brooklyn, N. Y.
Main 4-3804

THE PICK OF POWER EQUIPMENT

TURBO UNITS—60 Cy.

1—12000 KW General Electric Cond.
1— 6250 KVA General Electric Cond.
1— 4000 KW General Electric Cond.
1— 4000 KVA Allis Chalmers Cond.
1— 3125 KVA General Electric Cond.
1— 2850 KVA Westinghouse Cond.
1— 1250 KVA General Electric Cond.
1— 937 KVA General Electric Cond.
1— 750 KVA General Electric Cond.
1— 750 KVA Terry Double Extr. Cond.
1— 375 KVA General Electric Cond.
1— 250 KVA General Electric Cond.
1— 938 KVA West. 375# I.P. 100# B.P. N-C.
1— 937 KVA Moore-Allis N-C. Bleeder
1— 312 KVA Moore Non-Condensing
1— 250 KVA Westinghouse Non-C.
1— 200 KW Elliott Non-Condensing
1— 125 KVA Moore Non-Condensing
1— 125 KVA Westinghouse Non-C.
1— 63.5 KVA Westinghouse Non-C.

STEAM ENGINE UNITS—60 Cy.

1—1067 KVA Nordberg Uniflow
2— 937 KVA Nordberg Uniflow
1— 500 KVA Rice & Sargent Corliss
1— 325 KVA Skinner Uniflow
1— 300 KVA Hamilton 4-valve
1— 250 KVA Harrisburg Uniflow
1— 150 KVA Hamilton Poppet Valve

DC STEAM ENGINE UNITS

1—500 KW Skinner Uniflow 250 V.
1—350 KW Ridgway 4-valve 250 V.
1—300 KW Skinner Uniflow 250 V.
1—300 KW Erie City 4-valve 250 V.
1—200 KW Chuse 4-valve 250 V.
1—150 KW Erie Ball 4-valve 250 V.
1—150 KW Ames Uniflow 125 V.
1—100 KW Ames Uniflow 120 V.
1—100 KW Elliott 4-valve 250 V. 3-wire
1— 75 KW Skinner Uniflow 250 V.
1— 50 KW Ames Uniflow 125/250 V. 3-wire

OIL & GAS ENGINE UNITS—60 Cy.

1—1000 KVA Cooper (gas) 240 V.
1— 720 KW McInt.-Seymour 2300 V.
1— 400 KW West. (gas) 440 V.
1— 300 KVA Fair.-Morse 2400 V.
1— 187 KVA McInt.-Seymour 2300 V.

WATER TUBE BOILERS

4—1000 HP Heine 250-lb. Oil Fired
1—1000 HP Edge Moor 200-lb. Stokers
1— 800 HP Connelly 250-lb. Stoker
4— 750 HP Edge Moor 200-lb.
2— 633 HP Bigelow Hornsby 225-lb.
6— 600 HP Stirling 180-lb. Stokers
2— 520 HP Heine 200-lb. Hand Fired
1— 512 HP Stirling 200-lb. Stoker
2— 490 HP Stirling 200-lb.
8— 400 HP Stirling 200-lb.
1— 400 HP B. & W. 160-lb. Stoker
2— 350 HP Stirling 200-lb.
2— 302 HP B. & W. 200-lb. Hand Fired
2— 302 HP B. & W. 160-lb. Hand Fired
2— 282 HP Edge Moor 200-lb. Stokers
1— 253 HP Stirling 180-lb.

SYNCHRONOUS MOTORS—60 Cy.

2—800 HP Electric Machy. 6600 V. 450 RPM
1—400 HP Allis Chalmers 2300 V. 600 RPM
1—290 HP Allis Chalmers 2300 V. 600 RPM
1—200 HP General Electric 2200 V. 1800 RPM
1—175 HP General Electric 230 V. 225 RPM
1—175 HP General Electric 220 V. 200 RPM
1—150 HP General Electric 440 V. 164 RPM
1—100 HP General Electric 4000 V. 900 RPM
1—100 HP General Electric 2300 V. 240 RPM

INDUCTION MOTORS—60 Cy.

2—800 HP G. E. slip ring 2300 V. 300 RPM
4—3500 HP G.E. slip ring 2300 V. 120 RPM
2—400 HP G. E. slip ring 3800 V. 1800 RPM
2—300 HP G. E. sq. cage 440 V. 600 RPM
2—250 HP G. E. sq. cage 4000 V. 1200 RPM
1—250 HP G. E. slip ring 2200 V. 450 RPM

AIR COMPRESSORS

1—2100 Ft. 65-lb. Worth. 60 cy. motor
1—1300 Ft. 100-lb. Sullivan Diesel
1—1200 Ft. 100-lb. Ing. 2-stage, belt driven
1—1052 Ft. 100-lb. Ing. XRE, 60 Cy. motor

OIL CIRCUIT BREAKERS

1— 800 A. 87 KV Am.Br.Bov. AF22 Outdoor
2— 600 A. 73 KV West. G222AS Outdoor
1— 400 A. 73 KV G. E. FKO 36 Outdoor
2— 600 A. 37 KV Condit FO40A Outdoor
4— 400 A. 34.5 KV Condit D-16-A Outdoor
2—1000 A. 30 KV Kelman CB-76 Outdoor
1— 400 A. 25 KV G. E. FKO136 Outdoor
2— 600 A. 15 KV Kelman CB-76 Outdoor
1— 400 A. 15 KV G. E. FKO37 Outdoor

FREQUENCY CHANGERS

2—3125 KVA West. 25/62½ cy. 750 RPM
1—3000 KVA G. E. 60/25 cy. 300 RPM
1—2500 KVA West. 25/60 cy. 300 RPM
1—1500 KW G. E. 25/60 cy. 300 RPM
1—1000 KVA G. E. 60/25 cy. 514 RPM
1— 750 KVA G. E. 25/60 cy. 300 RPM

ROTARY CONVERTERS—60 Cy.

1—1000 KW Westinghouse, 600 V.
1— 750 KW Westinghouse, 600 V.
2— 500 KW General Electric, 250 V.
1— 500 KW General Electric, 600 V.
2— 300 KW General Electric, 600 V.

SYNCHRONOUS CONDENSERS

1—4000 KVA G. E. 13200 V. 514 RPM
1—2000 KVA G. E. 11000/2200 V. 720 RPM
1—2000 KVA C. W. 11000 V. 600 RPM
1—1000 KVA G. E. 2300 V. 900 RPM
1— 500 KVA West. 2200 V. 900 RPM

TRANSFORMERS—1 Ph. 60 Cy.

3— 600 KVA West., 120,000/2300 V.
1—5000 KVA Allis, 72000/6600 V. 3 ph.
3— 500 KVA West. 66000/2400 V.
1— 500 KVA West. 33000/2400-4152 V.
3— 500 KVA Allis, 33000/480 V.
6— 250 KVA Penn. 34500-17250/4600-2300 V.
1—10000 KVA G. E. 26400 Y/2300 V. 3 ph.
3— 1500 KVA Pitts. 22000/6600 V.
2— 1000 KVA G. E. 23000-115°0/575 V.
3— 833 KVA West. 22000/2300 V.
4— 667 KVA West. 22000-11000/2300 V.
3— 250 KVA G. E. 22000/11000 V.
1—10000 KVA Pitts., 13200/4600 V. 3 ph.
2— 5000 KVA American, 13800/2300 V.
3— 500 KVA West. 13200/600 V.
1— 450 KVA G. E. 132 0/240-480 V. 3 ph.
3— 150 KVA Pitts. 13800/230-460 V.
3—1000 KVA Packard, 11000/2300-4000 V.
3— 150 KVA Pitts., 11000/2400 V.
3— 100 KVA West., 11000/250-125 V.
3—1250 KVA G. E., 6600/550 V.
3— 833 KVA Penn., 4800/120-240 V.
3—1000 KVA Pitts., 2300-4600/550 V.
2— 333 KVA Pitts., 2400/220 V.
4— 150 KVA G. E., 2300/115-230 V.
6— 100 KVA Pitts., 2300/575 V.
6— 50 KVA G. E., 2400/240-120 V.

PARTIAL LIST—WE HAVE ALL CLASSES OF POWER EQUIPMENT

BREW, WOLTMAN & Co., INC.

50 CHURCH STREET, NEW YORK CITY

POWER PLANT EQUIPMENT CO., INC.

39 Cortlandt Street
New York, N. Y.

AC TURBINE UNITS

6250 KVA G.E. 2300 V. cond.
4000 KVA Al. Chal. cond.
3125 KVA G.E. 2300 V. cond.
2500 KVA G.E. 2300 V. cond.
1875 KVA Al. Chal. 2300 V. cond.
1250 KVA (2) G.E. 2300/4000 V. cond.
1000 KVA Wghse., 2 ph., 600 V., cond.
937 KVA G.E. 2300/600 V., Non-Cond.
937 KVA G.E. 2300 V., 550° cond.
937 KVA Al. Chal.-Kerr 480/240 V. Non-cond.
937 KVA Al. Chal.—Elliott, 480/240 V., cond. or mixed pressure; with Jet Condenser, etc.
780 KVA Al. Chal. 2300 V., with Surface Condenser, Radio-Air Ejectors, etc. NEW, never in service.
625 KVA Wghse, 2300 V.
625 KVA Al. Chal. 2 ph., 2400 V.
625 KVA G.E. 2300 V.; Bleeder; Condensor.
625 KVA Al. Chal.-Kerr 240/480 V. Non-Cond.
625 KVA Al. Chal.—Elliott, 240/480 V., Automatic Bleeder, with Jet or Surface Condensor.
625 KVA Wghse. 2400 V.
375 KVA G.E. 2300 V., non-cond.
375 KVA Al. Chal. 2 ph., 2400 V.
375 KVA G.E. 2300 V., Bleeder.
312 KVA Ridgeway-Elliot 480/240 V., with Jet Condensor. Condensing or Mixed Pressure.
187½ KVA Wghse. 220/440 V., non-cond.
150 KVA Wghse. 240/480 V.
75 KVA Al. Chal. 240-440 V. non-cond.

BLEEDER TURBINE UNIT

625 KVA Allis Chalmers-Elliott 3 ph. 60 cy. 240/480 v.; automatic bleeder; with jet or surface condensor

AC ENGINE UNITS

375 KVA G.E. 22x27 Erie Ball 4 V.
250 KVA G.E. 17x20 Erie Ball 4 V.
320 KVA Al. Chal.-Nordberg Uniflow.
225 KVA G.E.—18x36 Hamilton Corliss.
225 KVA G.E. 15x24 Nordberg Uniflow.
187 KVA G.E. —18x21 Chuse Uniflow.
150 KVA (2) G.E.—16x16 Skinner Uniflow.
125 KVA G.E. 14x15 Skinner Uniflow.
112 KVA G.E. 14x18 Erie Ball 4 V.
100 KVA G.E. 14x16 Skinner Uniflow.

BOILERS (ASME)

638 HP Bigelow Hornsby, 225 lbs.
500 HP Murray (Heine) 200#
420 HP Sterling, 200#
320 HP Sterling, 200#
302 HP Babcock & Wilcox, 200#
295 HP (3) Sterling, 200#
253 HP (2) Heine, 160#—cross drum.

GAS & DIESEL UNITS

1000 KVA G.E. 3 ph. 60 cy.; with Cooper Bessemer Nat. Gas. Engine.
375 KVA Wghse. 3 ph. 60 cy.; Busch-Sulzer.
219 KVA G.E. 3 ph., 60 cy. Worthington
200 KVA G.E. 3 ph. 60 cy.; Busch-Sulzer.

ENGINE (Steam)

20x21 Skinner Uniflow, belted, 175 lbs. (15 to 25 lbs. b.p.)

TRANSFORMERS (3 Phase)

5—1800 KVA G.E. 14,520/11,400-600/480 V.
3—1050 KVA G.E. 11,000/22,000-445 V.
1— 300 KVA Mal. 13,200/6600-220/440 V.
5— 150 KVA Mal., 4160/2400-800-400 V.
1— 150 KVA G.E. 13,800-230/460 V.
1— 150 KVA Wagner, 13,860-110/220 V.
1— 100 KVA Wagner, 13,860-220/110 V.

TRANSFORMERS (Single Phase)

7—1667 KVA G.E. 43,350/75000-2300 V.
4—1250 KVA Wghse, 32,500/12,000-2300/4000 V.
3— 833 KVA Wghse., 22,000-2200 V.
4— 750 KVA Wghse., 36,440/63,000-6900 V.
2— 687 KVA Maloney 13,800-460 V.
3— 500 KVA Wghse., 66,000/33,000-2400 V.
6— 500 Pittsburgh 6600-2300/4000 V.
3— 500 KVA Wghse., 22,000-2200 V.
2— 500 KVA Maloney, 2200-220 V.
3— 333 KVA G.E., 11,000-440 V.
6— 300 KVA Pitts., 22,000-2200-440 V.
2— 250 KVA G. E. 6600-2300 V.
6— 250 Penn. 34,500/17250-4600/2300 V.
3— 250 KVA Packard 22,000-2300 V.
1— 200 KVA G.E. 13,800-230/460 V.
1— 200 KVA Wghse. 11,200-2300/4000 V.
4— 200 KVA G.E. 13,200-2300 V.
4— 150 KVA G.E. 2300/4000-115/230 V.
3— 150 KVA Wghse. 11,000-440 V.
3— 150 KVA G.E. 13,200-115/230 V.
3— 100 KVA G.E. 2200-220 V.
3— 100 KVA G.E. 13,200/6600-2300 V.
2— 100 KVA G.E. 600-120/240 V.
2— 100 KVA G.E. 13,800-115/230 V.
3— 100 KVA Kuhl, 13200-2300 V.
3— 100 KVA Al. Chal. 22,000-440 V.
3— 100 KVA G.E. 13,200-4000/2300/460 V.

We offer—AVAILABLE FOR PROMPT DELIVERY

(Subject to prior sale)

CRANES—Locomotive

15 ton Brownhoist, 50' boom
20 ton Industrial, 50' boom

CRANES—Gantry

McMyler Portal Pier, electric
Brownhoist Portal Pier, elec.

CRANES—Crawler

No. 104 Northwest Gas, 55' Boom
¾ Yd. Model 206 P & H Gas, 38' Boom

CRANES, Overhead

5 ton Shaw, 55'6" span
7½ ton Shaw, 36'11" span, 220 V. D.C.
10 ton Clev., 36'11" span, 220 V. D.C.
7½ ton Alfred Box, 60' span, 3 motor
15 ton Browning, 36' span, 4 motor A.C.

BOILERS

3—300 H.P. B. & W., 160#
4—450 H.P. B. & W., 180# senous
1—504 H.P. Sterling, 165# Class 2-30
6—600 H.P. B. & W., 183# with stokers
1—650 H.P. B. & W., 225# steel header
1—728 H.P. Erie 200# vertical with superheater

COMPRESSORS

1— 300 C.F.M. Chi. Pneu. steam-driven
1— 400 C.F.M. Ingersoll-Rand with 75 H.P. A.C. Motor
1—1000 C.F.M. Laidlaw Dunn, steam-dr.
1—1440 C.F.M. Worthington, steam-dr.
1—4000 C.F.M. Nordberg with 750 H.P. Diesel engine

ELECTRICAL EQUIPMENT

GENERATORS

40 KW G. E. Type MP 110 V.D.C. belt drive, 860 RPM, 360 amps.
200 KW Westg. #201 SK, comp. wound, 600 V.D.C. with 290 H.P. syn. motor, 3/60/2200, 900 RPM
300 H.P. Buckeye Diesel Engine & Gen. 3/60/240.
500 KW G.E. Skinner Uniflow Steam Eng. Gen., 250 V. D.C.
100 KW G.E. Type ATB-2-1250-3600 Form T, 814 amps, 3/60/2200-900 RPM
5000 KW Turbo Generator, 3/60/2300 3600 RPM, 185# W.P.
POWER PLANT—Complete with two 625 KW Turbo Generators 3/60/2300, complete with 309 H.P. each Heine Water Tube Boilers, 225# steam pressure

USED D. C. MOTORS

3 H.P. G.E., 230 V. shunt wound, 1150 RPM
3 H.P. Reliance, 220 V., 600/1200 RPM
3½ H.P. West. Elec., 220 V., 850 RPM
5 H.P. C-W, 220 V., 950 RPM
5 H.P. Watson, Vert., 1300 RPM
5 H.P. G.E., 230 V. comp. wound, 850 RPM
5 H.P. C.W., 230 V., 950 RPM
5 H.P. G.E., 230 V., shunt wound, 1100 RPM
7½ H.P. G.E. Shunt wound, 825 RPM, 230 V. D.C.
7½ H.P. West. #6 Type "S" shunt wound, var. sp.
8 H.P. G.E., 230 V. D.C., 810 RPM
8 H.P. C-W, 220 V., 535/1070 RPM
10 H.P. G.E. shunt wound, 230 V. D.C., 650 RPM
10 H.P. A.C. inter. duty, 220 V. D.C., 500/1200
10 H.P. Triumph shunt wound, 230 V. D.C., 760 RPM
13 H.P. Westg. #8 Type S, 220 V. D.C., var. speed, 375/750 RPM
15 H.P. Westg., 220 V. 500/100 RPM
42/50 H.P. Westg. 220 V. D.C., variable speed 500/1000 RPM, shunt wound

USED A. C. MOTORS

(Squirrel Cage)

15 H.P. Howell, 3/60/440	600 RPM
15 H.P. Gen. Elec., 3/60/220	1200 RPM
15 H.P. West., 3/60/440	850 RPM
15 H.P. Wagner, 3/60/440	850 RPM
20 H.P. Howell, 3/25/440	750 RPM
20 H.P. Westg. Type CCL 3/60/220	850 RPM
20 H.P. Gen. Elec., 3/60/400	900 RPM
25 H.P. A.C., 3/60/220	1200 RPM
25 H.P. West. Elec., 3/60/440	865?RPM
25 H.P. Gen. Elec., 3/60/440	1200 RPM
30 H.P. Westg., 3/60/220	1800 RPM
30 H.P. Westg., 3/60/440	840 RPM
30 H.P. Gen. Elec., 3/60/440	900 RPM
30 H.P. Gen. Elec., 3/60/440	870 RPM
35 H.P. West., 3/60/440	800 RPM
37½ H.P. Lincoln Vert., 3/60/220	1200 RPM
40 H.P. Gen. Elec., 3/60/440	1200 RPM
40 H.P. Gen. Elec., 3/60/440	900 RPM
40 H.P. West. Elec., 3/60/200	1140 RPM
40 H.P. Gen. Elec., 3/60/440	870 RPM
40 H.P. Westg., 3/60/440	870 RPM
50 H.P. Howell, 3/60/440	900 RPM
50 H.P. Watson, 3/60/440	1720 RPM
75 H.P. Gen. Elec., 3/60/440	900 RPM
75 H.P. Westg., 3/25/400	450 RPM

HOIST MOTORS

2—50 H.P. Ft. Wayne Elec. Co. Type "K", 600 RPM, 220 V. D.C.

We also have on hand miscellaneous electrical items, such as:

OIL SWITCHES
OIL CIRCUIT BREAKERS
LIGHTING GENERATORS
COMPENSATORS
100 H.P. SOLENOID ELEC. BRAKE

IRON & STEEL PRODUCTS, INC.

13488 S. Brainard Ave. 38 YEARS' EXPERIENCE **Chicago, Illinois**

"Anything containing IRON or STEEL"

Motor Generator Sets—Synchronous Motors, etc.

MOTOR GENERATOR SETS & ROTARIES
3 phase, 60 cycle, A.C.

2—West. 250 KW 250 Volt rotaries
1—West. 100 KW 250 Volt rotaries
1—West. 150 KW 275 Volt M. G.

VERTICAL MOTORS

1—G. E. 50 HP 1200 RPM 3 phase 60 cycle 220 Volt
1—Reliance Fan-cooled new 25 HP 1750 RPM 220/440 Volt

SYNCHRONOUS MOTORS
3 phase, 60 cycle

2—G. E. 700 HP 720 RPM 6600/4000/2300 Volt
1—Burke 300 HP 900 RPM 440/220 Volt
1—Ideal 50 HP 600 RPM 2300 Volt

SLIP RING MOTORS 3 phase, 60 cycle

Allis-Chalmers 250 HP 600 RPM 440 Volt
G. E. 60 HP 600 RPM 440 Volt
G. E. 62½ HP 1150 RPM 440/220 Volt
G. E. 25 HP 1150 RPM 220 Volt

ADJUSTABLE SPEED D.C. 230 Volt

1—West. Sk-180 100 HP 600/950 RPM
2—Electro Dynamic 60 HP 450/1200 RPM
1—Electro Dynamic 60 HP 525/1100 RPM
1—Reliance 1400-T 50 HP 175/700 RPM
1—G. E. 25 HP 400/1600 RPM
1—Reliance 25 HP 500/1500 RPM
3—G. E. 15 HP 450/1800 RPM
1—G. E. 15 HP 550/1100 RPM
1—G. E. 15 HP 500/1500 RPM
4—Electro Dynamic 15 HP 300/1200 RPM
1—G. E. 10 HP 250/1000 RPM
1—West. 10 HP 400/1600 RPM

ALTERNATOR SPECIAL, Allis-Chalmers, 125 KVA, 277 RPM, 3 phase, 60 cycle

The Electric Motor & Repair Co., Cuyahoga Falls, O.

YOUR OPPORTUNITY

1200 KW 325 lb. 3600 rpm Turbine only.
2500 KW G.E. 3/60/2300 V. Turbo Gen.
100 & 180 HP Diesel Generator Sets
150 HP Fairbanks Morse "Y" Oil Engines.
175 KW Nordberg Uniflow 3/60/2300 volt.
250 KW Nordberg Uniflow 3/60/220 volt.
200 KW 2300 V. Murray Corliss Generator.
200 KW 2300 V. Chuse Corliss Generator.
450 KVA, 4000 volt "Y" Syn. Condenser.
200 KVA 257 rpm 3/60/440 V. Generator.
75 KVA 257 rpm 3/60/2300 V. Generator.
35 HP 2 Drum & Swinger Clyde Gas Hoist.
85 to 900 HP Steam Boilers 150/250 lb.

MISSISSIPPI VALLEY EQUIPMENT CO.

507 Locust St. St. Louis, Mo.

"Have you anything for Sale?"

300 KW ROTARY CONVERTER

1—300 KW Westinghouse Rotary Converter, 600 volts D.C. 6 ph. 60 cy., pedestal bearings, 1200 RPM.

TRANSFORMERS

1—750 KVA Uptegraff 3 ph., 6600-4000.
1—100 KVA Pittsburgh 2200-220/440
3—75 KVA Pittsburgh 4000-220/440.
3—37½ KVA Westghse 4000-230/460.
1—37½ KVA Westghse. 2200-440.
2—37½ KVA Westghse. 2200-110/220.
1—37½ KVA Pittsburgh 2300-230.
1—15 KVA Pittsburgh 550-110/220.
1—10 KVA Allis. Chal. 600-115/230.
1—5 KVA Westghse. 2200-110/220.
10—1½ KVA Gen'l. Elect. 2200-110/220.

ELECTRIC EQUIPMENT FOR INDUSTRY

LET US KNOW YOUR REQUIREMENTS

60 KW MOTOR GENERATOR SET

1—60 KW Westinghouse Synch. Motor Gen. Set, Type SK Generator for 125 volts D.C. compound wound, 90 HP. Type G Synch. Motor for 3-60-220 volts, complete with semi-automatic control unit.

MILL AND CRANE MOTORS

CO-2011 MDS-109½, MC-90, CO-1812 MDS-108, CO-2007. CO-1810.

230 V.D.C. MOTORS

1—150 HP., W.E. Co., Type SK, 1750 RPM.
1—75 HP., W.E. Co., Type SK, 575/1150 RPM.
6—20 HP., G. E. Co., Type RC, 1150 RPM.
5—15 HP., G.E., Type LC, 300/600 RPM.
3—13½, W.E. Co., Type SK, 730/1460.
1—15 HP., G. E. Co., Type RC, 850 RPM.
5—15 HP., C. W. Co., Type CM, 1400/1700 RPM.
2—5 HP., G. E. Co., Type RC, 1150 RPM.
1—5 HP., W. E. Co., Type SK, 1100 RPM.
4—3 HP., W. E. Co., Type SK, 1150 RPM.

FREQUENCY CHANGERS — TURBO GENERATORS — AC & DC MANUAL MAGNETIC CONTROL — CENTRIFUGAL PUMPS — AC & DC SWITCHBOARDS

FOR DETAILS, WRITE **JOHN D. CRAWBUCK CO.** *714-15 EMPIRE BLDG. PITTSBURGH, PENNA.*

SLIP RING MOTORS, 3 PH., 60-CY.

HP	Volts	Make	Speed
700	2200	G.E.	900
400 (2)	440	Whse.	514
350	220–440	G.E.	1800
350	2200	G.E.	600
300	2300–4000	G.E.	1200
250	440–550	G.E.	600
200	2200–550	G.E.	1800
200	2200–440	G.E.	600
150	440–220	G.E.	1800
150	2200	G.E.	900
150	2200–440	Whse.	1800
150	550–2200	G.E.	1800
125	440–220	G.E.	600
100	550–2200	G.E.	720
100	440–220	G.E.	1800
100	220–440	G.E.	720
100	220–440	G.E.	900
75	220–440	G.E.	600

SYNCHRONOUS MOTORS, 3-PH., 60-CY.

600	2200	Whse.	900
400	440–220	Whse.	276
350	440–220	G.E.	200
240	2300–440–220	G.E.	600
200	2300–4000	G.E.	1200
150	2200	G.E.	1800
100	440–220	G.E.	1200
50	220–440	G E.	1200

TRANSFORMERS—60 CYCLE

3—667 kva., Whse. 22000-2300.
3—500 kva., Whse. 22000-2300.
3—400 kva., Al. Chal., type OISC 4150-2400.
3—350 kva., G.E., Type H-KD 13200-2300.
3—333 kva., G.E., type H-KDD 2400-460/230.
3—250 kva., Whse. 13,800-460.
3—200 kva., G.E., type H 10000-600.
3—200 kva., G.E., H-KD 6600-2300/4000Y., 25 cy.
3—175 kva. G.E. 4000-480.
3—150 kva., G.E., type H-KDD 13200-2300.
3—150 kva., Al. Chal., type OISC 10400-2400.
1—100 kva., Pittsburgh, type OISC 2400-240-120.
3—100 kva., G.E., type H 2400-240/480.
3—100 kva., G.E., type H-KDD, 6900/11950Y-230/115.
3—100 kva., Whse. 22,000-2300.
2— 75 kva., G.E., type HK, 2300-230/115.
3— 50 kva., Moloney, 2300-230/115.
6— 50 kva., Whse. type SK, 13800-240/120.
3— 50 kva., Whse. 22,000-2300.

A. C. GENERATORS

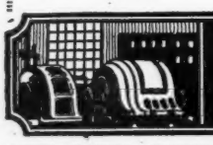
1—500 kva., 900 r.p.m., 2209 V. Whse. Condenser.
1—312 kva., 900 r.p.m., 2300 V., Westghse.
1—300 kva., 600 r.p.m., 240-480-V., G.E.
1—225 kva., 600 r.p.m., 2200-240-V., G.E.
1—187 kva., 900 r.p.m., 2200-550-V., Westghse.

SQUIRREL CAGE MOTORS

HP	Volts	Make	Type	Speed
500	440/220	G.E.	IK	1200
500	440/220	G.E.	IK	900
400	2200	Whse.	C.S.	1800
50	2200	G.E.	IE-K	1800
250	2200	G.E.	I-K	600
200	220/440	G.E.	IK	720
150	2200	Allis. Ch.	AN	450
100	2200	G.E.	IK	600
100	2200	G.E.	IE-K	1800
100	550	G.E.	KT	900
100	220/440	G.E.	KT	720
75	2200	G.E.	KT	900
75	2300	G.E.	IE-K	1800
50	220/440	G.E.	K	1800

MOTOR GENERATOR SETS

1—100 K.W., 250 V., 1200 R.P.M., Ridgeway, con. to 150 H.P., 2200 V., 3 ph., 60 cy., syn. motor.
1—75 K.W., 250 V., 1800 R.P.M., Cr. Wh., Type CCD con. to 100 H.P., 2200 V., 3 ph., 60 cy. Syn.
1—60 K.W., 125 V., 1200 R.P.M., G.E., type RC to 90 H.P., 4150/2300 V., 3 ph., 60 cy. syn.
1—50 K.W., 250 V., 720 R.P.M., Whse., Type SK con. to 75 H.P. 220/440 V., 3 ph., 60 cy. Sq.c.



STEPHEN HALL & COMPANY, INC.

458 Seventh St., Hoboken, N.J.

250 VOLT ROTARY CONVERTERS

1—1500 KW. Westinghouse compound interpole 250 V. D.C., 6 phase, 60 cycle AC Rotary converter, 600 RPM.
3 Single phase, 2300 Volt Transformers 1—DC and 1—AC panel for above.

2—1000 KW., Westinghouse compound interpole 250 volt DC, 6 phase, 60 Cycle AC Rotary Converter 900 RPM.
2—Banks of 3 Single phase, 2300 volt transformers for above and 2—DC and 2—AC panels.

The above in excellent condition.

The above are just a few of the thousand of items we have in Motors, Generators, Turbo Generators, Engine Generators, Motor Generators, Transformers, Circuit Breakers, etc. Please send us your inquiries. What have you for sale?

GEORGE SACHSENMAIER CO.
8403 Hegerman Street
Philadelphia, Pa.

POWER PLANT EQUIPMENT

TURBO-GENERATORS

1—3000 KW G.E. 600 V. Cond.
1—2500 KW G.E. 2300 V. Cond.
1— 625 KW Terry-Allis—600 V. Cond.
1— 500 KW G.E. 240 V. Cond.
1— 500 KW G.E. 2300 V. Mixed P.
1— 500 KW G.E. 600 V. Cond.
1— 175 H.P. G.E. Turbine—only.

AIR COMPRESSORS

1—1214 Cu. Ft.—Sull Angle 100#.
1— 782 Cu. Ft.—IR—55#.
1— 599 Cu. Ft.—IR—2 stage Belted.
1— 146 Cu. Ft.—IR—3 stage Belted. 1200#.

G.E. CENTRIFUGAL COMPRESSOR

Type WM—675—8800/10800.
Volume—8800/10800 Pressure 32/39.6.
Driven by 820 H.P. G.E. Turbine.
Condition excellent.

BOILERS

4—1000 H.P. Heine 250#.
1— 60 H.P. HRT—125#

BOILER FEED PUMP

1—Duplex Steam—17"x10"x15".

BELTED GENERATOR

1—500 KW. G.E. 550 V. 225—RPM.

INDUCED DRAFT FAN

1—126,000 CFM to 210 HP Turbines.
1—165,000 CFM to 450 HP Turbine.

Also transformers, engines and cranes
Send us your inquiries

A. LEE ELLIS CO., U. S. Mchy. Bldg., Boston, Mass.
The Buyer Must Be Satisfied—Always

O. E. T. CRANES

1—75 Ton Case—64'8¼" Span
2—20 Ton Morgan—50' Span
2— 2 Ton Northern—40' Span
2— 1 Ton Northern—40' Span
1—50,000 Gallon Tank & Tower

H. & P. MACHINERY CO.
5819 Enright Ave. St. Louis, Mo.
Many other sizes—Try Us

1—Westinghouse CS, 500 HP, 450 rpm, AC motor. Needs rewinding. Will rewind to any speed and voltage within capacity of frame.
1—70 KW M-G Set, 250 volt DC, 2300/440/220-3-60 AC.
1—50 KW M-G Set, 250 volt DC, 2300/4000-3-60 AC with switchboard.
Many transformers, motors, generators, etc.
SEND US YOUR INQUIRIES

JACKSON BAYLEY ELECTRIC CO.
CANTON, OHIO

HIGH-PRESSURE BOILERS

"New and Used — NOT Abused"!

JOE SULLIVAN CO.
523 N. Hamlin Ave. CHICAGO, ILL.
Phone—VanBuren 8667

STEAM GENERATING SET

125 KW 3 Phase, 440 Volts, direct connected to Chuse Horizontal Steam Engine, with Governor Switch Board, Exciter, etc.

SYNCHRONOUS MOTORS

1—275 hp.—600 RPM 440 Volts—7% P.F. G.E. Type ATI 3 Bearing Synchronous Motors with Starters

Reconditioned and Guaranteed
IMMEDIATE DELIVERY

PACIFIC MACHINERY CO.
156 Montgomery St., San Francisco, Calif.
Phone—Sutter 3943

IMMEDIATE DELIVERY

CRANES—BOILERS

Cranes—Overhead traveling—with cab.
10—20 ton electric 50' span.
75 ton electric 70' span.
400'-Span Bridge Crane with 10 yard Bucket.
Cableway 250'-265' Tower.
Tanks—100,000 and 300,000 gallon.
Boilers—All sizes with or without stokers. Vertical 25 to 75 HP, 125 pound pressure. Horizontal, water tube, firebox. 50 to 1000 HP.
4—500 and 200 lb. pressure

H. A. Woodworth Engineering Co.
705 Olive St. ST. LOUIS, MO.

PIPE
CUT TO SKETCH ⅛ to 24"
METROPOLITAN
PLUMBING SUPPLY CO., INC.
INDUSTRIAL AND MARINE SUPPLIES
Large SURPLUS STOCKS
STEEL--WROUGHT IRON--CAST IRON
BRASS-COPPER-CEMENT LINED PIPE
Power Plant Valves & Engineering Specialties - Jenkins - Fairbanks & Stirro Valves
313 EAST 31st STREET, N.Y.C.
HOURLY NATION-WIDE SHIPMENTS
Phone MU rray Hill 3-3408
FLANGED VALVES & FITTINGS

MOTORS • GENERATORS • TRANSFORMERS

Prices on Application

3 PHASE, 60 CYCLE, 220/440 V.

HP	Make	RPM	Type	Frame
5	West.	1200	CCL	2 phase
5	American	600	totally enc.	ball bearing
7½	Gen. Elect.	1800	KT	944
7½	Gen. Elect.	1800	KQ	944 2 phase
10	Fairbanks Morse	900	KBY	
10	Crocker Wheeler	900	Nema	365
10	Burke	1800		
15	Reliance	1200		2 phase
15	Howell	900		2 phase
20	Gen. Elect.	1800	KQ501	2 phase
20	Gen. Elect.	565	I	Form K
25	Gen. Elect.	1740	KQ312	2 phase
25	Armor	1200	ball bearing	2 phase
25	Gen. Elect.	1800	KT	312
30	Gen. Elect.	3600	KT	513
30	Armor	695	ball bearing	2 phase
50	West.	1200	MS	
50	Fairbanks Morse	1800	ball bearing	
50	Fairbanks Morse	1800	ball bearing	
50	West.	1800	CS	
60	Gen. Elect.	1800	I	form K
75	Gen. Elect.	1800	I	form K
75	Gen. Elect.	900	KT	552
100	Gen. Elect.	1800	I	form K
100	West.	1800	CS	
150	Gen. Elect.	1200	I	form K
150	Gen. Elect.	1200	I	form K

MOTOR GENERATOR SETS

1—100 KW Ridgeway sets 250 v. DC. 1200 RPM direct connected to 150 HP. Ridgeway synchronous motors, 3/2200/60/1200 complete with panels.

1—100 KW. Crocker Wheeler 250 v. DC 500 RPM direct connected to 150 HP General Electric Motor 3 PH 25 cycle 2200 volts 500 RPM, complete.

1—75 KW Ridgeway 140 v. DC 1200 RPM direct connected to 120 HP Ridgeway synchronous motor 3/2200/60/1200 RPM. Complete.

1—35 KW Westinghouse Generator 125 volt DC 1450 RPM direct connected to 53 HP West. CS motor 3 ph. 25 cy. 220 v. 1450 RPM. complete.

WANTED

Write—Wire—or Phone

1—125 or 150 H.P. 230 Volt D.C. Motor. 200/1200 RPM. or any 6—1 ratio. Wire if you have this motor.

SLIPRING MOTORS

60 CYCLE, 3 PHASE, 220/440 VOLTS

HP	Make	Speed	Type	Frame
10	Gen. Elect.	1800	MT	303
15	Gen. Elect.	1800	I	form M
20	Gen. Elect.	545	MT	332
20	Westinghouse	575	CW	648A
20	Westinghouse	575	CW	ball bearing
25	Westinghouse	690	CW	
30	Gen. Elect.	1800	MT	327
30	Gen. Elect.	1800	I	form M
40	Westinghouse	690	CW	748
40	Westinghouse	690	CW	748A
40	Westinghouse	690	CW	748A
40	Westinghouse	690	CW	748A
50	Westinghouse	900	CW	
60	Westinghouse	720	CW	2200 volt
75	Westinghouse	1800	CW	
300	Gen. Elect.	1200	I	form M
500	Westinghouse	600	CW	

TRANSFORMERS

Amt.	Kva.	Make	Cycle	Voltage
21	25	G.E.	25	2300/230/460
6	40	G.E.	5	2300/230/460
6	30	G.E.	25	2300/115/230
24	50	G.E.	25	2300/230/460
3	50	Packard	25	6900/230/460
18	50	G.E.	60	4160/4600/230/460
3	75	60	60	4160/4600/230/460
18	100	G.E.	60	4160/4600/230/460
3	100	Kuhlman	25	2300/230/460
3	200	G.E.	60	2300/230/460
3	200	G.E.	60	6900/230/460
3	200	Kuhlman	60	4160/4600/230/460
3	500	Pitts.	25	11500/220
3	1000	Pitts.	60	2300/4600/230/460

Prices on Application

3 PHASE, 25 CYCLE, 220/440 VOLTS

HP	Make	RPM	Type	Frame
50	Gen. Elect.	750	I	form K
50	Westinghouse	750	CS	
75	Gen. Elect.	750	KT	357
75	Gen. Elect.	750	I	form K
100	Gen. Elect.	750	I	form K
100	Gen. Elect.	300	117	form K
150	Gen. Elect.	750	I	form K
150	Gen. Elect.	750	I	form K
200	Westinghouse	460	CS	2200 volt
200	Gen. Elect.	750	I	form K
225	Elec. Machinery	500	2200 volt	synchronous
1150	Gen. Elect.	375	2300 volt	synchronous
200	Westinghouse	235	CW	slipring

SPECIAL MOTORS

1100 H.P. General Electric Synchronous Motor, 3 ph., 25 cy., 11,500/6600/2200 V., 375 RPM.

500 H.P. Allis-Chalmers, 3 ph., 25 cy., 440 V., 490 R.P.M., Complete.

300 H.P. G.E. Slipring, 25 cy., 3 ph., 2200 V., 500 RPM, 3 bearing; complete with controls.

225 H.P. Electric Mchy Co. Synchronous, 3 ph., 25 cy., 2200 V., 500 R.P.M. with controls.

1—100 H.P. G.E. Synch. Motors, 3 ph., 25 cy., 220/440 V., with control equipment.

1—20 HP. Gen. Elec. Motor 230 v. DC. Type CD83 1750 RPM.

1—75 HP. Westinghouse Motor Type SK, 230 v. DC 475/950 RPM variable speed.

FREQUENCY CHANGERS

2—1250 KVA Gen. Elec. Synchronous—motor 3/25/2200 750 RPM. direct connected to Generator 3/62½/440 V. Complete with exciters and panels.

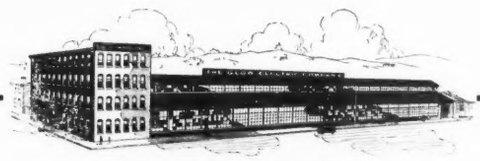
1—200 KW General Electric 3 ph., 60 cy., 2300 V. direct connected to 290 HP. Gen. Elec. Synchronous Motor, 3 ph., 25 cy., 440 volt, 750 RPM. Complete with panels.

1—120 KVA Gen. Elec. Induction Frequency Changer, 440 V., 3 Phase, 62½ Cycle. Driving motor 100 H.P., 3/25/440/720 RPM. Complete.

94 KVA Westinghouse Synchronous Set Generator, 63½ cy., 230 v., 750 RPM with panels. Motor 112 HP. 3/25/2300/750 Synchronous with starting equipment.

ERIE ELECTRIC CO., INC.

124 CHURCH ST. BUFFALO, N. Y. CL. 4758



AT YOUR SERVICE

120,000 SQ. FT. OF WAREHOUSE SPACE . .

. . . Housing our Complete Rebuilding Facilities . . . Also a wide range of Electric Motors and Power Plant Equipment

•

Today's Demand for Reconditioned Equipment Obsoletes Our Stock Listing Before It Can Be Printed.

Write your requirements for

MOTORS
GENERATORS
MOTOR-GENERATOR SETS
ENGINE-GENERATOR UNITS

THE GLOW ELECTRIC CO.

945 HARRIET ST. Phone MA. 3024 CINCINNATI, OHIO

BOILERS

NEW and USED!

All makes & sizes for prompt shipments

4—500 H.P. Stirling 160#.
6—500 H.P. Edge Moor 200#.
1—200 H.P. Heine 150#.

Miscellaneous sizes

J. F. DAVIS CO.

122 S. Michigan Ave. CHICAGO

DIESEL ENGINE

AND

GENERATOR

Worthington Full Diesel Engine, vertical, 240 HP, 4 cylinder, 2 cycle, 327 RPM, direct connected to General Electric 219 KVA Generator, 2300 volt, 3 phase, 60 cycle. Switchboards.

DENNY & CLARK

910 N. Marshfield Ave. Chicago, Ill.

Stokers - Stacks - Boilers - Cranes

Stokers 2—350 HP Hoffman Firite used 2 years.
3—350 HP chain grate forced draft.
4—500 HP chain grate forced draft.
Stacks 12' dia.—5½'—30".
Boilers—25000 HP all sizes.
Cranes—90 Ton 65' span electric Cab control.

H. A. WOODWORTH ENGINEERING CO.
705 Olive Street • St. Louis, Missouri

December Specials

1—40 KW C-W Type CCD, 250 v., 1100 RPM
1—25 HP GE-MTC 3/60/550/720 New
1—60 HP GE-MTC 3/60/550/900 New
1—6.6 KW 115 DC to 3/60/220 MG Set, GE Factory built.
2—50 HP A.C. Slipring 3/60/220/900

MILTON WERBY & CO.
423 Atlantic Ave. Boston, Mass.

FOR SALE

1—180 H.P. Allis-Chalmers, Horiz. 2-Cylinder 16" x 24" Full Diesel Direct Connected to 156.5 Kva. 3/60/2300-Volt Generator.

1—280 H.P. De La Vergne, Horiz., 2-Cylinder 20" x 34 Full Diesel Solid Injection, Direct Connected to 240 Kva G-E Generator 3/60/2300 V. Both have Exciters, and Switch Boards

All Ready for shipment—Kansas City.
Write
W. L. Sullivan, P. O. Box 236, Oklahoma City

COMPLETE POWER PLANT

Installed in 1937

Consisting of:

3—337 H.P. B. & W. Water Tube Boilers

Oil Burners Installed by Petroleum Heat & Power Co.

1—160 KW Gen. Elect. 3 Ph/60c/220V /220 RPM Generator Connected to:

1—20x20 Harrisburg Fleming 4 Valve Engine. With:

1—12 KW. DC. Exciter

Complete Switchboard with all necessary Instruments.

Worthington Feed Boiler Pumps—Duplex

Breachings & Steel Smoke Stake 110 ft. High

Vacuum Pump, Motor Driven

Sump pump, motor driven

1—Kelly-Patterson Hot Water Heater with copper coils

1—Worthington Open type Water Heater good for 1000 HP

All Pipings, fittings, valves, & header

All Non Return Valves, Bends to Header, and everything pertaining to make up a complete power plant.

Have all data when material was purchased

Wanted:

1—50 ton Steam Driven Ammonia Compressor Complete with high side Receiver and Condensers.

YOUR INSPECTION INVITED

A. BILSKY

197 Broadway Brooklyn, N. Y.

Power Plant & Refrigeration Equipment

Phone: Ev - 8 - 2166

POWER PLANT EQUIPMENT

Located in Mid-West on Foundations

(unless otherwise specified)

DIESEL-GENERATOR SETS

2—500 H.P. Atlas Diesel Engines 21" bore, 30" stroke, 180 r.p.m. each dir. con. to 300 KW Allis-Chalmers AC Generators 3/60/4000 180 r.p.m. with Exciter and Switchboard.
Complete with Starting Equipment.

TURBO-GENERATOR SETS

1—250 H.P. West. non-cond. steam turbine, dir. con. to 150 KVA West. AC Generator 3/60/2400, with Exciter.
1—250 KW Terry non-cond .steam turbine, dir. con. to 250 KVA Burke AC Generator 3/60/2300, with Exciter.
2—Elliott Steam Turbines, horiz, non-cond. 100 H.P. Loca. Brooklyn, N. Y.

STEAM ENGINE-GENERATOR SETS

2—107 HP Ball four-valve 11" x 16" Steam Engines, dir. con. to 75 KVA Gen. Elec. Generators 3/60/2300. With Exciters.
1—160 HP Ball four-valve 11" x 16" Steam Engine, dir. con. to 125 KVA Gen. Elec. Generator 3/60/2300. With Exciter.
1—Chuse 12" x 16" Steam Engine, dir. con. to 90 KVA Gen. Elec. Generator 3/60/2300.
1—Chuse 150 HP 16" x 19" Steam Engine dir. con. to 150 KVA Gen. Elec. Generator 3/60/2300. With Exciter.
1—200 HP West. 14" x 24" vertical compound engine, dir. con. to 175 KVA Elec. Mach. Co. Generator 3/60/2400. With Exciter.
1—175 HP Fitchburg 14"x20" Steam Engine dir. con. to 125 KVA Gen. Elec. Generator 3/60/2300. With Exciter.
2—30 KW Westinghouse Direct Current Generators, 125 Volts, dir. con. to Westinghouse non-cond. steam engines, vertical. Loca. Brooklyn, N. Y.

BOILERS

5—150 HP Horizontal Return Tubular Boilers, 125 lb. steam pressure.
1—150 HP Horizontal Return Tubular Boiler, Low pressure.
2—250 HP Erie Water Tube Boilers, 160 lb. steam pressure.
2—300 HP Beth. Scotch Marine Boilers, 9' diam. by 19' long, built for 60 lbs. pressure. Loca. Brooklyn, N. Y.

BROOKLYN CONTRACTORS MACHINERY EXCHANGE, Inc.

725-734 Fifth Ave. Brooklyn, N. Y.

Phone South 8-4900—4901—4902—4903—4904

LIQUIDATING LARGE INDUSTRIAL PLANT

USED AND REBUILT CRITICAL EQUIPMENT

Immediately available

Badenhausen boilers 350# and 160# pressure, engine generator sets, 100 electric motors up to 300 h.p., voltages up to 2200, 12,000 feet 12" cast iron pipe, pumps, air compressor, steam locomotive (standard gauge), Corliss steam engines, tanks, valves, fittings, structural steel, sprinkler system, concrete mixer, machine tools and many other critical items.

Send for complete detailed list.

E. L. ELLIOTT

Bowling Green 9-3010 52 Wall Street, N. Y. C.

STEAM PUMPING ENGINES

1—**Snow** 6 mgd. C&FW Cr. Com. Opp. Type Cond. 20-40x14¾x36, with waterwork type cond.
1—**Allis-Chal.** 4 mgd. cr. com. cond. Size 12x28x13x24. Fine cond.
Worth Dup. Pump size 16x12x12, cap. 1100 gpm. heavy water wks. type.
1—20" **Rensselaer** #13 Iron Body Bronze Mounted Hub End **Gate Valve** with 16" Iron Brass Lined Hydl. Cyl. with indicating Rod & eyebolt. 100# max. press. on gates, 50# min. Cyl. Operating press.
1—24" **Crane** 125# Flanged Hand Wheel operating **Gate Valve.**

SURFACE CONDENSER

1—10 AD 4 pass 210 ft. **Foster Wheeler** over Comb. Air Circulating and Tail pump.

BIRCH MANUFACTURING COMPANY

1523 Sedgwick St. Chicago, Ill.

VALVES

INDUSTRIAL & MARINE

METROPOLITAN PLUMBING SUPPLY CO., INC.

Power Plant Valves and Engineering Specialties for Oil, Steam, Gas, Air, Liquids and Chemicals.
Jenkins, Fairbanks, Sarco, Powell Valves and surplus.
Large Complete Stocks ⅛" to 24"
313 EAST 31st ST., NEW YORK CITY
For Hourly Nation-wide Shipments
CALL MUrray Hill 3-3408

SKETCH PIPE & FITTINGS

WE BUY AND SELL

MOTORS
TRANSFORMERS
MOTOR GEN. SETS
OIL SWITCHES
AIR CIRCUIT BREAKERS

ELECTRIC EQUIPMENT CO.
675 Lake Ave., Rochester, N. Y.
Tel: Glenwood 6783

STEEL TANKS—PUMPS

22,000 gal. **Tank on 44 ft. Tower.**
35,000 gal. **Tank on 90 ft. Tower.**
40,000 gal. **Tank on 100 ft. Tower.**
50,000 gal. **Tank on 100 ft. Tower.**
80,000 gal. **Tank on 68 ft. Tower.**
100,000 gal. **Tank on 40 ft. Tower.**
1,000, 5,000 & 10,000 BBl. **Oil Tanks.**
3—20,000 gal. **Horizontal Oil Tanks.**
6—11,000 gal., 12—5,000 gal. **Horizontal Tanks.**
3—500-750 & 1,000 GPM. **Steam Underwriters Fire Pumps.**

Tanks and Pumps bought and sold.

TIDEWATER

EQUIPMENT & MACHINERY CORP.

60 E. 42nd St. New York, N. Y.

FOR SALE

4—GE 7 ton **COMBINATION TROLLEY BATTERY** ***LOCOMOTIVES***
3—Ironton 5 ton **BATTERY** ***LOCOMOTIVES***
200—***MINE CARS,*** wood body
All are 44" gauge but may readily be changed to narrower gauge.
1—25 KW Motor Generator ***BATTERY CHARGER***

Also a number of **DIESEL MOTOR GENERATORS, TRANSFORMERS, COMPRESSORS, BOILERS, ETC.**

Associated Metals & Minerals Corp.

40 Rector Street New York, N. Y.

POWER EQUIPMENT FOR PROMPT SHIPMENT

SQUIRREL CAGE MOTORS (3ph. 60 cy.)

HP	Make	Volts	Speed	Type
700	G.E.	6600	1800	
450	West.	2200/220/440	50	CS
400 (5)	West.	2200/220/440	500	CS
350	West.	2200/220/440	500	CS
200	Al.Ch.	2200	600	
150	West.	220/440	580	CCL
125/40	Cr.Wh.	2200	700	125 AQ
125	Cr.Wh.	2200	700	125 AQ
100	Burke	220/440	900	
100	F. M.	220/440	600	BB

DC SERIES WOUND MOTORS

HP	Make	Type	Speed
15	West.		650
25	Shaw		600
30	G.E.	CO2002	610
35	Cr.Wh.	SM	565
50	Shaw		600
75	G.E.	211 Int.	550
100	G.E.	MD108	480
130	G.E.	CO1812	550
175	G.E.	MDS 190¼	475

SYN. MOTORS, 3 ph. 60 cy.

HP	Make	Volts	Speed
300	Al.Ch.	2200	600
75 (2)	G.E.	2200	900

SLIP RING MOTORS (3 ph. 60 cy.)

HP	Make	Volts	Speed	Type
1000	Al.Ch.	440	235	
700	G.E.	2200	393	MT 432
300	G.E.	440	600	I-M
200	Cr.Wh.	2300	440	28
200	G.E.	2200	240	MT 412
150	G.E.	220/440	720	I-M
150	G.E.	220	575	I-M
125	Al.Ch.	2200	435	
100	Al.Ch.	220/440	575	
100	G.E.-25 cy.	220/440	500	MI-108

"Wound Rotor Motors" (3 ph. 60 cy.)

HP	Make	Volts	Speed	Type
200	G.E.	2200	600	I-L
150	G.E.	2200	600	I-L
125	G.E.	2200	600	I-L.

OIL ENGINE DRIVE AIR COMPRESSOR

Chicago Pneumatic simplate valve type NSO3 straight line 16½ & 11 x 18" capacity 492 cu. ft. displacement, 100# pressure, with air receiver and starting air compressor.

M-G SETS 3 ph. 60 cy. (Syn.)

150 KW West. 550 v. DC—2200 AC 1200 RPM
125 KW Cr. Wh. 250 v. DC—440 v. AC 1200 RPM
100 KW G.E. 550 v. DC—2200 v. 900 RPM
90 KW Al. Chal. 230 v. DC 2200 v. AC 900 RPM

SHOP HOISTS

1—1 Ton Euclid AC Hook type, floor control
1—2 Ton Euclid AC with motor driven trolley cab or floor control
1—1 Ton Sprague 230 v. DC
2—2 Ton Sprague 230/500 v. DC Monorail

In addition to the above, we have hundreds of other items in stock—kindly send us your inquiries.

MOORHEAD-REITMEYER CO., INC.

Pittsburgh, Pennsylvania

IF YOU DON'T KNOW MACHINERY—KNOW YOUR MACHINERY DEALER

Motors, M-G Sets, Generator

ONE (1) 200 KVA, Westinghouse, 440 volt, 60 cycle, 3 phase, 900 RPM, two bearing AC generator, with direct connected 125 volt exciter and complete switchboard equipment.

This generator can be operated as a synchronous motor rated at approximately 250 H.P.

TWO (2) 75 H.P., Electric Machinery Company, 440 volt, 60 cycle, 3 phase, 150 RPM, unity, power factor, two bearing pedestal type, synchronous motors equipped with Cutler Hammer Automatic magnetic control together with

ONE (1) 10 KW, Westinghouse, type CS, SK, 125 volt, DC, 440 volt, 60 cycle, 3 phase, AC, MG set with switchboard, each motor equipped with Cutler Hammer magnetic clutch designed for 870 lbs. torque.

ONE (1) 300 H.P., GE, type I, form P, 440 volt, 60 cycle, 3 phase, 900 RPM, continuous rated wound rotor motor.

TWO (2) 40 H.P., GE, type KT, vertical motor, frame 352, 220 volt, 60 cycle, 3 phase, 580 RPM, model 2866, ser. #2445588-589.

ONE (1) 15 H.P., GE, KT, vertical motor, frame 332, other characteristics, the same as above.

Penn Electrical Engineering Company

Scranton, Pa.

SYNCHRONOUS CONVERTERS

500 KW WEST. 250 D.C. 2300/4000 A.C. 1200 RPM
500 KW G.E. 250 D.C. 2300/4000 A.C. 1200 RPM
500 KW G.E. 600 D.C. 2300/4000 A.C. 1200 RPM
300 KW G.E. 600 D.C. 2300/4000 A.C. 1200 RPM
200 KW AL-CH. 250 D.C. 2300/4000 A.C. 1200 RPM
150 KW G.E. 250 D.C. 2300/4000 A.C. 1200 RPM

MOTOR GENERATORS

200 KW G.E. SYN. 250 V. 2300/4000 A.C. 1200 RPM
200 KW G.E. SYN. 250 V. 2300/4000 A.C. 720 RPM
200 KW G.E. IND. 600 V. 2300 A.C. 1200 RPM
200 KW R.W. SYN. 250 V. 2300/4000 A.C. 900 RPM

TURBO GENERATOR SET

300 KW GENERAL ELECTRIC-CURTIS, 250 V. D.C. Turbine, Non-Condensing, 100# Steam Pressure, 3600 RPM. GEN. ELEC. 300 KW, MPC Generator and D.C. Panel.

Each unit listed above is owned by us and is Available now for immediate purchase.

WALLACE E. KIRK CO.

Incorporated

502 Grant Building Pittsburgh, Pa.

FOR SALE

One 100 K. W. 250 volt D. C. **Turbo Generator Turbine-Curtis** Form C, 2 stage 3600 R.P.M. 150# S.W.P.
Generator—100 K.W. **General Electric** Type MFC, Class 4-100-3600 Form T, 400 Amps, 250 volts D.C.

PILOT MARINE CORP.
25 Beaver Street New York, New York

MUST SELL

Crane—Boilers—Elevated Water Tanks.
75 ton 64' Span Overhead Traveling Electric Cab Control.
4—500 H.P. with forced draft stokers. 200#.
2—350 H.P. 175# forced draft stokers, Used but two years.
50000 Gallon 100 ft. tower water storage.

H. A. WOODWORTH ENGINEERING CO.
705 Olive St. Louis, Mo.

1—DC GENERATOR SET

Gasoline-driven

Star Generator: 28 V, 400 amp. SB20 W
Engine: Buffalo, Type BA.
Complete with Panel.

1—AC GENERATOR SET

Gasoline-driven

Westinghouse Generator: 48 KVA, 3 phase, 120/240/480 V; 28 KVA, single phase, 120/240 V, 117 amp., 1800 rpm, 60 cyc., direct connected exciter.
Engine: Continental, 6 cylinder gasoline engine, complete with Switchboard with Circuit Breaker, Voltmeter, ammeter and Silverstat Regulator.

Electric Apparatus Repair Co.

1410-12 North Sixth Street Phila., Pa.

PRICED RIGHT FOR QUICK SALE

2—150-ton Wolfe Linde ICE MACHINES. Cylinders 11¼x21¼" direct connected to Elec. Mcy. Co. 165 HP 3/60/220 V. 100 RPM Motors, DC Excitation P.F. 100% 47 Amps.

1—machine—Chandeyson Motor Generator Set, 40 HP 3/60/220 V. direct connected to 25 KW Generator 1720 RPM 125 volts 160 Amp., 30 HP Cutler-Hammer Auto Transformer Starter.

1—machine—Chandeyson Motor Generator Set, 20 HP 3/60/220 V. direct connected to 15 KW Generator, 125 volts, 120 Amp., 25 HP Starter, 68 Amp., 3/60/220 V.

WILL SELL MOTOR EQUIPMENT SEPARATELY

INDUSTRIAL BUILDINGS CO.

2031 West 74th St. **CHICAGO, ILL.**

PROspect 8770

ROTARY CONVERTERS

2—150 KW Westinghouse Rotary Converters, Type SK, 250 Volt DC, 1200 RPM, 6 Phase. Complete with switchboard and 2300 Volt Transformers.

MOTOR GENERATOR SETS

2—37½ KW Westinghouse Motor Generator Sets, Type SK, 600 Volt DC, 1200 RPM. Direct connected to 50 HP Westinghouse Squirrel Cage Motors, Type CS, 3/60/220/1200 RPM. Complete with Field Rheostats. Units like new.

Philadelphia Transformer Co.

2829 Cedar St. Philadelphia, Pa.

SEARCHLIGHT SECTION

POWER PLANT EQUIPMENT FOR SALE

6—443 H.P., B & W boilers, 205 lbs.
5—4½" Consol. boiler safety valves, 205 lbs.
1—16" Chapman (Hopkinson) flg'd. gate valve, 600 lbs.
1—3600 GPH Deming water pump, 75 lbs. for motor drive
1—Transformer transfer car, capacity 70 tons.
1—2340 GPH American steam pump, 100 lbs.
1—54000 CFH Connersville exhauster, 2-3 lbs., Engine driven
2—1800 GPH Viking water pumps, 180 lb., motor driven
1—14 x 10½ x 12 Blake Steam pump
1—40 H.P. Lee steam turbine, 125 lb.

Consolidated Gas Electric Light and Power Company of Baltimore

Purchasing Agent — Baltimore, Maryland

1—3000 KW. TURBO 60 CY. 3 PH. 480 V. WITH COND.
1—4000 KW. TURBO 4150 V. 60 CY. 3 PH. WITH COND.
Heat Exchanger 606 tubes 1¼ x 9' 6" long.
1500 CFM 2 STAGE AIR COMP. 275 HP. SYN. MOTOR DRIVE.
3—100 KW. 125-250 V. DC G.E. TURBOS Non-Cond.
2 New Fans 66750 CFM 2" to 6" Press.
4—Cent. Pumps 4166 GPM, 162' Head with AC Motors.
2—800 HP. 60 CY. 3 PH. 450 RPM MOTORS.
1—2500 HP. 240 RPM, 6600 V. 60 CY. 3 PH. MOTOR, AUX.
Traveling Crane 75 ton Case, 64' span, 3 Motors.
750 KW. and 110 KW. AC Hydro Elec. Plants (also others).

ROSS POWER EQUIPMENT CO., Indianapolis, Ind.

TURBINE SET

300 K.W. G.E.
3 ph. 60 cy. 2300 v.
Non-condensing

JAMES K. HOOPER
50 Church Street — New York City

FOR SALE:

One (1) Cochrane Open Type Boiler Feed Water Heater of approximately 25 H.P. and equipped with trays.

FS-325, Power
330 West 42nd St., New York City

FOR SALE
PIPE, VALVES ETC.

100 ft.—18", ⅜" wall Van Stone pipe random lengths, 250# C.I. Flanges. Also 3—90 degree bends, 9 ft. radius and 3 offset lengths. Lagged with 1½" Magnesia. 2—18", 250# Ludlow gate valves. 1—18", 250# Steam Separator. 3—18", 250# C.I. Flanged Tees.

FS-333, Power
520 No. Michigan Ave., Chicago, Ill.

WANTED

WANTED

FURNACE

Immediately—One 200# induction type electric furnace or a "U" or "T" size Moore 'Lectromelt furnace. Furnish full information as to age, condition, serial number, price, location, and delivery.

CAMPBELL, WYANT & CANNON FOUNDRY CO.
MUSKEGON, MICHIGAN

TRANSFORMERS

TRANSFORMERS WANTED

in operating condition or burnt out. Mail us list giving complete nameplate data and stating condition.

We Rewind, Repair and Redesign all Makes and Sizes
ALL TRANSFORMERS GUARANTEED FOR ONE YEAR
We will be pleased to quote prices on request.

THE ELECTRIC SERVICE CO., INC.
"AMERICA'S USED TRANSFORMER CLEARING HOUSE"
STATION M — Since 1912 — CINCINNATI, OHIO

WANTED—TO BUY

1 only used 1000 H.P. **Hydro Generating Unit,** 380 Ft. Head, 3 Phase, 60 Cycle, 2300 Volts, Complete with Governing Apparatus, Switches, etc. Communicate direct to

The Red River Lumber Company
WESTWOOD, CALIFORNIA

"SEARCHLIGHT" is *Opportunity Advertising . . .*

1—to help you find what you want.
2—to help you sell what you no longer need.

For every business want THINK "SEARCHLIGHT" FIRST

If you don't see what you want . . .

ASK FOR IT

IF you don't see the equipment advertised that you want, ask for it —ask the advertisers—or we will gladly ask them for you.

Departmental Staff,
POWER

STATIONARY OR MARINE DIESEL ENGINES

With or without Generators

8—M.A.N. Nelseco Design Vertical, Reversing Diesel Engines 8-cylinder, 4-cycle, 14½" bore by 16" stroke. Each complete with overspeed governor, water circulating pump, lubricating oil pump and fuel oil pump.

RATING: Horse Power	R.P.M.	K.W.	Voltage
350	250	240	220
526	300	372	240
700	350	490	260
770	370	540	275

Overall dimensions: 9'9" high, 4'3" wide, 25'8" long approx. weight 70,000 lbs.
Engines can be furnished with Westinghouse Direct Current Generators 220 volts, 250 r.p.m., or, Alternating Current Generators.

PHONE OR WRITE

BROOKLYN CONTRACTORS MACHINERY EXCHANGE, Inc.

725-735 FIFTH AVE. PHONE SOUTH 8-4900-4901 -4902-4903-4904 BROOKLYN, N. Y.

FOR SALE

2—135 HP, Keeler Water Tube Boilers.
2—90 HP HRT Boilers Ohio Standard.
100 KW. M.G. Set. Refrigerating Machinery.

PARKE PETTEGREW & SON COMPANY

370 W. Broad St. Columbus, Ohio

FOR SALE

1—Venn-Severin Diesel, 100 H.P. Complete.
2—Arctic Horizontal Ammonia Compressors—one cy., 10½ x 15¾—120 R.P.M.
1—12 x 18—120 R.P.M. Westinghouse Generator.
75 K.W. 3 p. 60 cy. 440 volts 900 R.P.M.—International Filter—Leather Belting—Motors.
All items in good condition.

BAY CITY FREEZER, INC.
Bay City, Michigan

FOR SALE

BOILER

105 H.P. Double Duty Keeler Boiler, all auto. completely reconditioned 2 years ago. Reduced price for quick sale.

GUNTHER WOLFF INC.
Williamsport, Pa.

Ridgway Steam Engine Generator

500 H.P. Engine, 509 H.P. Bore 24" x 26" stroke 4 Valve, nonreleasing Corliss type
Generator, 300 K.W. 1200 Amp., 125/250 Volt.
Speed 150 R.P.M. 3 wire with balance coil.
Generator left hand, facing steam end.

Excellent condition, in operation.

THE EUCLID DOAN POWER CO.
1981 East 105th St. Cleveland, Ohio

"SEARCHLIGHT"

can help you . . .

—by bringing business needs or "opportunities" to the attention of other men associated in executive, management, sales and responsible technical, engineering and operating capacities with the industries served by the following McGraw-Hill publications:

The SEARCHLIGHT SECTIONS
(Classified Advertising)

American Machinist
Aviation
Business Week
Bus Transportation
Chemical and Metallurgical Engineering
Coal Age
Construction Methods
Electrical Contracting
Electrical Merchandising
Electrical World
Electronics
Engineering and Mining Journal
Engineering News-Record
E. & M. J. Markets
Factory Management and Maintenance
Food Industries
Power
Product Engineering
Textile World
Transit Journal

For advertising rates or other information address

Departmental Staff

McGRAW-HILL PUBLICATIONS
New York, N. Y.

TWO TURBINES

For Sale

1—2500 K.W. General Elec. Co. 175# pressure, 3 Ph., 60 Cycle, 2300 Volt, 3600 R.P.M. 80% P.F. with LeBlanc jet condenser.

1—3200 K.W. Allis-Chalmers 175# pressure, 3 Ph., 60 Cycle, 2300 Volt, 3600 R.P.M. 80% P.F. with LeBlanc jet condensers.

Exciters and Switchboard.

Attractive price for quick disposal

WILLIAM G. HEINER, Trustee
1321 Park Bldg.
Pittsburgh, Pa.

1—600 KW G.E. 480 V—3 Ph.—60 Cy.—**Prov. Eng. Rise & Sargent** cross compound condensing with Jet-Condensers; I. P. 175#, 100° SH; with G. E. Belted Exciter. Swbd.

1—300 KVA, G. E. 480 V.—3 Ph.—60 cy. **Ames Unaflow twin non-condensing,** I.P. 175#, 100° S.H., B.P. 10#; Swbd.

1—400 KW, 80% P.F. **Allis-Chalmers Corliss non-condensing,** I.P. 200#, 150° S.H., B.P. 30#; belted exciter; Swbd.

1—500 KVA 164 RPM **Syn. Motor** 480 V.—3 ph.—60 cy.; Swbd.

2—72" x 18' and 2—72" x 16' **HRT Boilers** 150#, with stacks, etc.

SONOCO PRODUCTS COMPANY
HARTSVILLE, S. C.

FOR SALE BY OWNER

1—625 Sq. Ft. Wheeler Surface Condenser complete with one 20" gate valve, vertical steam driven air and condensate pump and electrically driven centrifugal circulating pump.

1—Burnham boiler feed pump 12 x 7 x 12 manufactured by Union Steam Pump Co.

1—Triplex pump size 3½" x 4½" manufactured by the Platt Iron Works Co.

F.S. 326, Power
330 West 42d St. New York City

FOR SALE

JODIE POWER PLANT EQUIPMENT

In operation September 1942

2—253 H.P.—B. & W. Stirling Water Tube Boilers—Class E—No. 22
2—No. 20, P. S. Iron Fireman Pneumatic Spreader Type Stokers
1—Ball Steam Engine—Horizontal, Single Cylinder No. 5610; 538 H.P. 150 R.P.M., Direct connected to Generator described below:
1—300 K. W. Westinghouse Generator No. 1068665—Type Q Interpole; Compound Wound; 500 Amp., 600 V.
1—Ridgway Steam Engine — Horizontal, Single Cylinder #3632; 328 H.P., 180 R.P.M. Direct connected to Generator described below:
1—200 K.W. Ridgway Generator #2957; Design 40 D 10—Compound Wound, Compensating Fields 333 Amps., 600 Volts; 180 R.P.M. (Cost of Engine & Generator
1—No. 456 Cochrane Feed Water Heater; 1000 B.H.P. 48" x 56" x 90½"
1—McGowan Steam Pump, #19472—Duplex Double Action, Size 7½" x 4½" x 6"
1—Worthington Steam Pump, #709876—Duplex Double Action, Size 7½" x 4½" x 10"
1—Metropolitan Ejector
1—8" Figure 33 Vertical Type Cochrane Steam Separator
1—No. 24 Stirling Steam Trap 150-lbs. Pressure Exhaust Pipe, Fittings, Valves, etc.
1—Whistle
1—Lagonda Air Tube Cleaner
11—Tubes for Boilers
Switchboard and Instruments (Worth today 300% more than when purchased)

Appraised Value 64½% of cost price.

Location: On Chesapeake & Ohio R. R., BRYCE, WEST VIRGINIA

FOR IMMEDIATE DELIVERY

Will be sold complete or in part

THE GAULEY MOUNTAIN COAL COMPANY

Ansted, Fayette County, West Virginia

FOR SALE

FROM SALT LAKE CITY, UTAH:

1—520 HP HAMILTON CORLISS ENGINE GENERATOR SET, DIRECT CONNECTED TO G. E. 360 KW GENERATOR, 3/60/480 VOLT, 150 RPM, WITH G. E. EXCITER AND WESTINGHOUSE 3 PANEL SWITCHBOARD.

"Your inquiries solicited"

BRILL Equipment Co.
183 VARICK STREET NEW YORK

ADVERTISERS' INDEX

Where an * appears after a name the advertisement does not appear in this issue, but appeared in preceding issues.

Airetool Mfg. Co. ..... *
Air Preheater Corp. 249
Air Reduction ..... *
Akron Metallic Gasket Co. 228
Alco Products Division 155
Aldrich Pump Co. ..... *
Allen-Sherman-Hoff Co. ..... *
Allis-Chalmers Mfg. Co. 6–7
Allpax Co. ..... *
American Blower Corp. ..... *
American Brass Co. 121
American Chain & Cable Co. 176–177
American Chimney Co. ..... *
American Coal Burner Co. 264
American District Steam Co. 160
American Engineering Co. 12–13
American Locomotive Co. 56, 155
American Metal Hose Branch ..... *
American Pulley Co. ..... *
American Pulverizer Co. 219
American Radiator & Standard Sanitary Corp. ..... *
Anderson Co., V. D. ..... *
Armor-Clad Co. 255
Armstrong Cork Co. 218
Armstrong Machine Works 236, 270
Askania Regulator Co. ..... *
Atlas Lumnite Cement ..... *
Atlas Valve Co. 281

Babbitt Steam Specialty Co. 154
Babcock & Wilcox Co. 8-9-10-11
Babcock & Wilcox Tube Co. ..... *
Bacharach Industrial Instrument Co. 289
Bailey Meter Co. 14–15
Baldwin De La Vergne Sales Corp. ..... *
Baldwin-Hill Co. 204, 209, 238
Baldwin Locomotive Works ..... *
Bartlett & Snow Co., C. O. ..... *
Bates Co., Walter 230
Beaumont Birch Co. ..... *
Belmont Packing & Rubber Co. ..... *
Best Eng. Co., W. N. 208
Bethlehem Steel Co. ..... *
Betz, W. H. & L. D. 203, 225, 262, 284
Biddle Co., James G. 138
Birch Mfg. Co. 279
Bird-Archer Co. 225, 238, 282, 283
Black, Sivalls & Bryson ..... *
Blaw-Knox Co. 24–25
Boiler Tube Co. of America ..... *
Bonney Forge & Tool Works 141
Borg Warner Corp. 26
Botfield Refractories Co. 255
Bowser & Co., S. F. ..... *
Brickseal Refractory Co. 164
Bridgeport Brass Co. ..... *
Brownell Co. ..... *
Brown Instrument Co. 51, 240, 254, 258, 266
Brunt Equipment Co. 211
Buell Engineering Co. ..... *
Buffalo Forge Co. 199
Buffalo Pumps ..... *
Builders-Providence 242
Burgess Battery Co. 244
Byers Co., A. M. 62

Canton Stoker Corp. 184
Carborundum Co. ..... *
Cardox Corp. 196
Carey Mfg. Co., Philip ..... Back Cover
Cash Co., A. W. ..... *
Chapman Valve Mfg. Co. 139
Chicago Metal Hose Corp. ..... *
Chicago Pneumatic Tool Co. ..... *
Chicksan Tool Co. ..... *
Cities Service Oil Co. ..... *
Clarage Fan Co. 147
Clark Bros. Co. ..... *
Cleaver-Brooks Co. ..... *
Cochrane Corp. 154, 233, 240, 261, 269
Coffin Jr. Co., J. S. 162
Collins Packing Co. 246
Combustion Engineering Co. 16–17
Condenser Service & Engineering Co. 181
Coppus Engineering Corp. 133
Corning Glass Works ..... *
Crane Co. 123
Crane Packing Co. ..... *
Croll Reynolds Co. 222, 239
Cryer Trap & Valve Co. 271
Cutler-Hammer, Inc. 107

Dampney Co. of America ..... *
Darling Valve & Mfg. Co. 27
Dart Mfg. Co., E. M. ..... *
Davis Regulator Co. ..... *
Dearborn Chemical Co. ..... *
De Laval Separator Co. 178
De Laval Steam Turbine Co. 58, 252
Deming Co. ..... *
Detroit Stoker Co. 263
Diamond Power Specialty Corp. 116–117
Dixon Crucible Co., Joseph 186

Eagle-Picher Lead Co. ..... *
Eddington Metal Specialties 244, 252
Edge Moor Iron Works 182
Edward Valve & Mfg. Co. 277
Ehret Magnesia Mfg. Co. 157
Electric Chemical Co. ..... *
Electric Controller & Mfg. Co. ..... *
Electric Storage Battery Co. 183
Electro Metallurgical Co. ..... *
Elgin Softener Corp. 283
Elliott Co. 4–5, 187
Engineer Co. 185
Ernst Water Column & Gauge Co. 150
Eureka Packing Co. ..... *
Everlasting Valve Co. 158

Fairbanks Co. 170
Fairbanks Morse & Co. ..... *
Fisher Governor Co. ..... *
Flexrock Co. ..... *
Flynn & Emrich Co. ..... *
Foote Bros. Gear & Machine Corp. 163
Foster Engineering Co. 230, 257, 259, 276
Foster Wheeler Corp. 38–39
Foxboro Co. ..... *
France Packing Co. ..... *
Frederick Iron & Steel Co. ..... *
Frick Co. ..... *
Fuller Co. 213, 253
Fulton Sylphon Co. 258

Gardner-Denver Co. ..... *
Garlock Packing Co. 42
General Coal Co. 174
General Electric Co. 32–33
General Regulator Corp. 127
Gifford-Wood Co. ..... *
Gilmer Co., L. H. 129
Globe Steel Tubes Co. 151
Golden-Anderson Valve Specialty Co. 140
Goodrich Co., B. F. 55
Goodyear Tire & Rubber Co. ..... *
Goulds Pumps ..... *
Graver Tank & Mfg. Co. ..... *
Graybar Electric Co. 214, 234, 248, 261, 265 282, 284
Greene, Tweed & Co. 162
Green Fire Brick Co., A. P. ..... *
Green Fuel Economizer Co. ..... *
Grinnell Co. 156
Gulf Oil Corp. 143
Gulf Refining Co. 143

Hagan Corp. 30–31
Hall Laboratories 18–19
Haynes Stellite Co. ..... *
Hays Corp. 202, 216, 227, 254
Hays Institute of Combustion ..... *
Henszey Co. ..... *
Hercules Float Works 154
Hill Pump Co. 279
Hoffman Combustion Engineering Co. 22–23
Homestead Valve Mfg. Co. 197
Honan-Crane Corp. ..... *
Huyette Co., Paul B. 144

Ideal Commutator Dresser Co. ..... *
Imperial Brass Mfg. Co. ..... *
Infilco Inc. 195
Ingersoll Rand Co. 168–169
International Nickel Co. 34, 145
Iron Fireman Mfg. Co. ..... *

Jenkins Bros. ..... *
Johns Manville 44–45
Johnson Service Co. ..... *
Johnston & Jennings Co. 47
Jones & Laughlin Steel Corp. ..... *
Jones Foundry & Machine Co., W. A. ..... *

Keasbey & Mattison Co. 137
Keeler Co., E. 125
Kellogg Co., M. W. 161
Kennedy Valve Mfg. Co. 191
Kewanee Boiler Corp. ..... *
Keystone Refractories Co. 255
Kieley & Mueller 158
Klingerit Inc. 279
Koppers Coal Co. ..... *
Koppers Co. ..... *

Laminated Shim Co. ..... *
Leavitt Machine Co. 260, 274
Leeds & Northrup Co. ..... Second Cover
Lincoln Electric Co. ..... *
Linde Air Products Co., The 36–37
Link-Belt Co. 3
Lonergan Co., J. E. 281
Lovejoy Flexible Coupling Co. 218
Ludlow Valve Mfg. Co. ..... *
Lummus Co. 192
Lunkenheimer Co. 221, 240, 275, 276 278, 279, 280

Macmillan Petroleum Corp. ..... *
Magnolia Metal Co. ..... *
Manhattan Rubber Mfg. Division Raybestos-Manhattan ..... *
Manzel Brothers Co. ..... *
Marley Co. 268
Marsh Corp., Jos. P. ..... *
Maxfal Chemical Co. ..... *
Maxim Silencer Co. ..... *
McGraw-Hill Book Co. 285
Metallizing Co. of America ..... *
Midwest Piping & Supply Co. 43
Minneapolis-Honeywell Regulator Co. 51 240, 254, 258, 266
Monsanto Chemical Co. ..... *
Morse Chain Co. 26
Multiple V-Belt Drive Assn. ..... *
Murray Mfg. Co., D. J. 234
Murray Iron Works Co. 148

National Aluminate Corp. 113
National Supply Co. 190
National Technical Laboratories 146
National Tube Co. ..... *
National Valve & Mfg. Co. 200
Nicholson & Co., W. H. 227, 269, 271

Nordberg Mfg. Co. ..... *
Northern Equipment Co. 119
Norton Co. ..... *
Nugent & Co., W. W. ..... *

Oakite Products ..... *
Ohio Injector Co. ..... *
Owens-Illinois Glass Co. ..... *
Ozalid Products Division ..... *

Pacific Pump Works ..... *
Peabody Engineering Corp. 153
Peerless Pump Division ..... *
Permutit Co. 152, 159
Philadelphia Gear Works 57
Pipe Fabrication Institute 180
Pittsburgh Piping & Equipment Co. 179
Plibrico Jointless Fire Brick Co. 205, 206, 255, 282
Pomona Pump Co. 251
Porter & Co., H. W. 214
Powell Co., Wm. 166–167
Power Piping Division 24–25
Prat-Daniel Corp. 212, 262
Pritchard & Co., J. F. ..... *
Proportioneers, Inc. ..... *
Pure Oil Co. 245

Raybestos-Manhattan ..... *
Reading-Pratt & Cady 176–177
Reeves Pulley Co. ..... *
Reliance Electric & Engineering Co. ..... *
Reliance Gauge Column Co. 52–53
Republic Flow Meters Co. 215, 221, 241, 280
Republic Steel Corp. ..... *
Research Corp. ..... *
Revere Copper & Brass 20–21
Rhoads & Sons, J. E. ..... *
Rice & Co., Cyrus Wm. ..... *
Richardson Scale Co. ..... *
Ric-Wil Co. 193
Riley Stoker Corp. 96–97
Robins Conveying Belt Co. 188
Rockbestos Products Corp. ..... *
Rockwell Co., W. S. 152
Roebling's Sons Co., John A. ..... *
Roller Smith Co. 206
Roper Corp., Geo. D. ..... *
Ross Heater & Mfg. Co. ..... *
Roto Co. 165
R-S Products Corp. ..... *

Sarco Co. ..... *
Sauerman Bros. Co. 264
Schramm Inc. ..... *
Scovill Mfg. Co. 111
Sea-Ro Packing Co. ..... *
Shaw Co., Benjamin F. 35
Shell Oil Co. 131
Simplex Valve & Meter Co. ..... *
Sinclair Refining Co. 149
Skinner Engine Co. ..... *
Sloan Valve Co. ..... *
Smith Refractories, Sanford C. ..... *
Smooth-On Mfg. Co. ..... *
Socony-Vacuum Oil Co. ..... *
South Bend Air Products 224
Sperry Products 289
Springfield Boiler Co. 28–29
Square D. Co. ..... *
Squires Co., C. E. 287
Standard Chemical Co. 245
Standard Oil Co. of California ..... *
Standard Oil Co. of Indiana ..... *
Star Electric Motor Co. 243
Star Test Pocket Pliers ..... *
Staynew Filter Corp. ..... *
Steel & Tubes Division ..... *
Stephens-Adamson Mfg. Co. 175
Stickle Steam Specialties Co. ..... *
Stock Engineering Co. 164
Strong, Carlisle & Hammond Co. 285
Sturtevant Co., B. F. 40–41
Sturtevant Mill Co. 220
Suhm Co. ..... *
Sullivan Machinery Co. ..... *
Sun Oil Co. ..... Third Cover
Superior Diesel Engine Div. 190
Swartowt Co. 312

Taylor & Co., W. A. ..... *
Taylor Forge & Pipe Works 198
Taylor Instrument Companies ..... *
Tejax Engineering Corp. 237
The Terry Steam Turbine Co. 54
Texas Co. 48–49
Thermoid Rubber Div. ..... *
Tide Water Associated Oil Co. ..... *
Timken Roller Bearing Co. ..... *
Todd Combustion Equipment ..... *
Toledo Pipe Threading Machine Co. ..... *
Tripp Metallic Packing Co. 288
Troy Engine & Machine Co. 50
Tube-Turns Inc. 115

Union Asbestos & Rubber Co. 204, 238, 248, 273
Union Carbide & Carbon Corp. 36–37
United States Gauge Co. 227
U. S. Steel Corp. Subsidiaries ..... *

Viking Pump Co. ..... *
Vogt Machine Co., Henry 46
Voss Co., J. H. H. ..... *

Walker-Packing Co., James 247
Walworth Co. 172–173
Warren Steam Pump Co. 250
Water Treatment Co. of America 142
Watson-Stillman Co. 226
Webster & Co., Warren 272
Wedge Protectors Inc. 287
Westinghouse Electric & Mfg. Co. 60–61
Weston Electrical Instrument Co. 202, 267
Wheelco Instruments Co. 203, 216, 254, 258
Where to Buy 288
Whitlock Mfg. Co. 232
Wickwire Spencer Steel Co. ..... *
Williams Gauge Co. 274
Wilson Inc., Thomas Co. 210
Wing Mfg. Co., L. J. 194
Woodward Governor Co. ..... *
Worthington Pump & Machinery Corp. 171
Wright Mfg. Division ..... *

X-Pando Corp. ..... *
Xzit Sales Co. ..... *

Yarnall-Waring Co. 109, 239, 244, 275, 283
Youngstown Sheet & Tube Co. 189

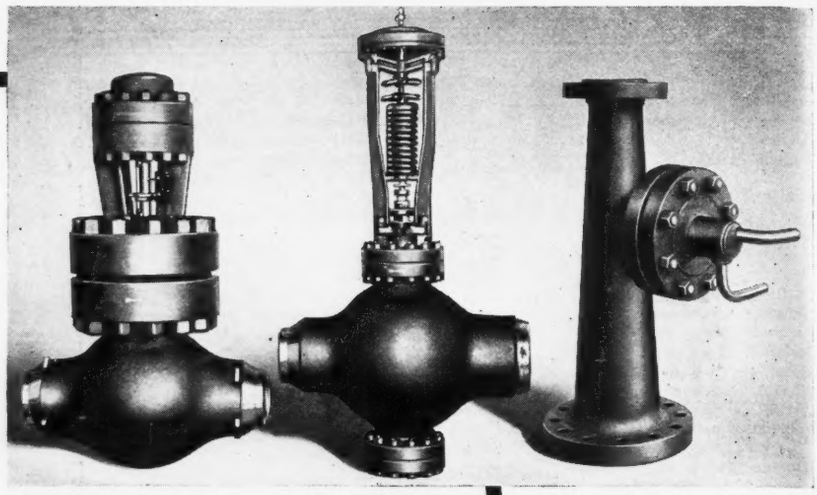
PROFESSIONAL SERVICES—288

SEARCHLIGHT SECTION

(Classified Advertising)

Classification	Page
BUSINESS OPPORTUNITIES	291
EMPLOYMENT SERVICES	291
MOTOR REWINDING	291
Hunt, C. V.	291
POSITIONS VACANT	291
POSITIONS WANTED	291
SELLING OPPORTUNITIES	291
WANTED TO PURCHASE	308
USED & SURPLUS EQUIPMENT	292-309
Associated Metals & Minerals Corp.	306
Bay City Freezer, Inc.	309
Belyea Co., Inc.	300
Bilskey, Al	306
Birch Manufacturing Co.	306
Brew, Woltman & Co., Inc.	302
Brill Equipment Corp.	309
Brooklyn Contractors Machinery Exch. Inc.	306, 309
Campbell, Wyant & Cannon Foundry Co.	308
Chicago Electric Co.	296
Consolidated Gas Electric Light & Power Co. of Baltimore	308
Crawbuck Co., John D.	303
Davis, J. F.	305
Denny & Clark	305
Dulien Steel Products Inc.	301
Duquesne Electric & Mfg. Co.	299
Electric Apparatus Repair Co.	307
Electric Equipment Co.	306
Electric Motor & Repair Co.	303
Electric Service Co., Inc.	308
Elliott, E. L.	306
Ellis Co., A. Lee	304
Erie Electric Co., Inc.	305
Euclid Doan Power Co.	309
Gauley Mountain Coal Co.	309
Glow Electric Co.	305
H & P Machinery Co.	304
Hall & Co., Stephen	304
Heat & Power Co., Inc.	300
Heiner, William G.	309
Hemphill & Co., Inc., J. L.	295
Hooper, J. K.	308
Industrial Building Co.	307
Iron & Steel Products, Inc.	303
Jackson-Bayley Electric Co.	304
Kirk Co., Wallace C.	307
Land & Co., L. J.	301
MacCabe Co., T. B.	298
Metropolitan Plumbing Supply Co., Inc.	304, 306
Mettler, A. T.	301
Mississippi Valley Equipment Co.	303
Moorhead-Reitmeyer Co., Inc.	307
National Power Machinery Co.	292-293
Pacific Machinery Co.	304
Penn Electrical Engineering Co.	307
Pettegrew & Son Co., Park	309
Philadelphia Transformer Co., Inc.	307
Pilot Marine Corp.	307
Power Plant Equipment Co., Inc.	302
Red River Lumber Co.	308
Ross Power Eq. Co.	308
Sachsenmeier Co., Geo.	304
Sonoco Products Co.	309
Stewart & Co., Inc., Paul	297
Sullivan Co., Joe	304
Sullivan, W. L.	291, 305
Tidewater Equipment & Machy. Corp.	305
Werby & Co., Milton	305
Wilms, Weaver & Co.	294
Wolff, Inc., Gunther	309
Woodworth Engr. Co., H. A.	304, 305, 307

Dependability you can bank on is built into every item of

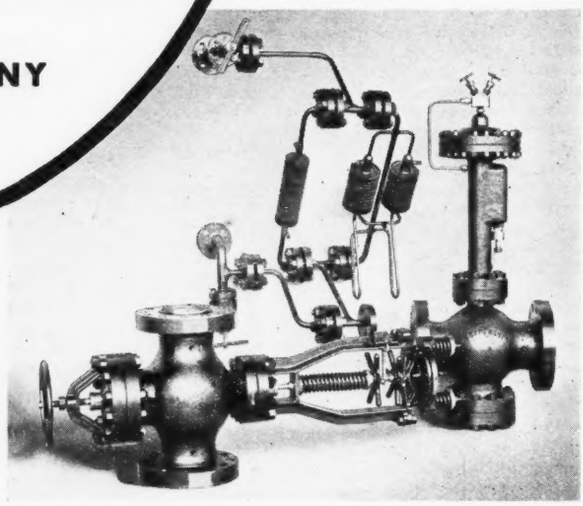


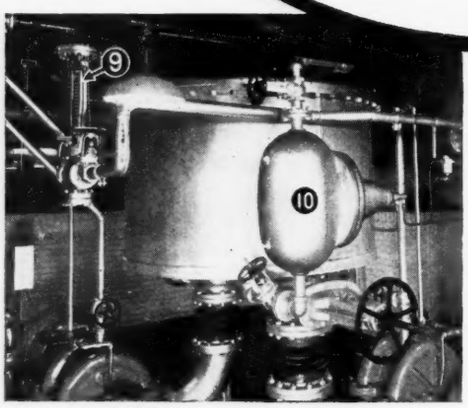
SWARTWOUT EQUIPMENT

Swartwout Controls for "both ends" of the boiler have a well-earned reputation for consistent performance and long life *with a minimum of maintenance.* From feed water heating to final control of steam pressures and temperatures, their rugged construction and engineered fitness for each specific job backs up the thirty-eight year old Swartwout guarantee of "complete satisfaction."

THE SWARTWOUT COMPANY
18501 Euclid Avenue
Cleveland, Ohio

REDUCING AND DESUPERHEATING
High pressure unit in which Swartwout furnished the whole station including the control master regulators and the water admission valves. Large valve on left is single seated, quick opening valve which cuts in in an emergency.

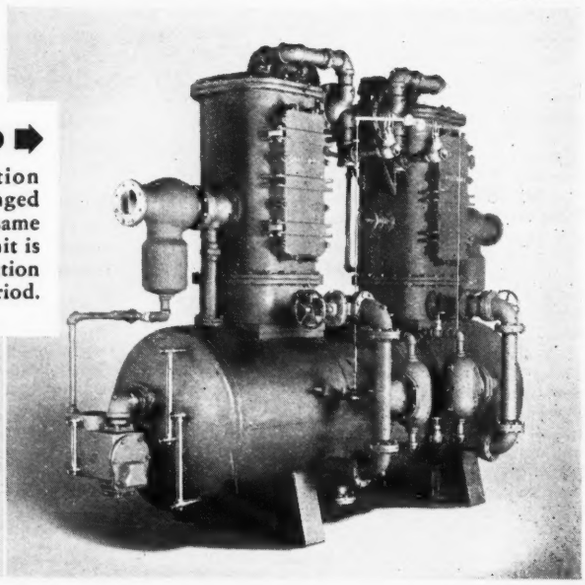




FEED WATER REGULATION and EXCESS PRESSURE CONTROL
900 pound standard unit in central generating station. Extra generator operates high and low water alarm system.

LIQUID LEVEL CONTROL
The air-actuated pilot-type float control operates by-pass valve in the line between the discharge of the condensate pump and the condensate hot well, thereby insuring a minimum "head" on the suction side of the pump.

FEED WATER HEATING AND DEAERATING. Twin installation with piping and shutoff valves arranged so both units can be operated at same time, or either alone. Thus one unit is available for cleaning and inspection during the low week-end load period.



Feed Water Regulators • Pump Governors • Feed Water Heaters
Master Controls • Reducing Valves • Separators • Exhaust Heads

Swartwout

•Power Plant Equipment•

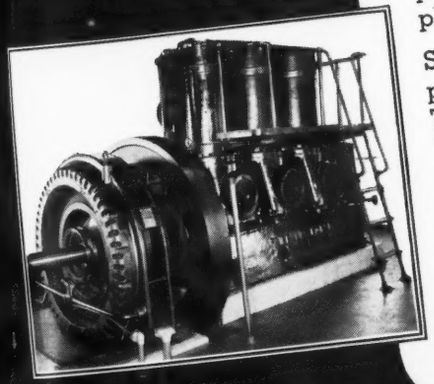
Unfailing Power Forges Speedier Victory

Continuous operation . . . no breakdowns . . . 13% saving in lubricant cost . . . with

SOLNUS OILS

Massive forgings for fighting ships . . . smaller forgings for arms for America and the uninterrupted production of them depend on the "power heart" of this forging plant — the diesel engines.

Seven large diesel engines supply the power to speed this victory production. Three of them have been in operation for 16 years on a 24 hour basis and lubricated with Sun Diesel Oils. Today these same engines are operating with original cylinders, the walls of which have never been rebored and there has never been a breakdown due to faulty lubrication. That's a typical record set with Sun Solnus Oils — the modern diesel lubricants developed to give long hours of uninterrupted operation.



Long liner life . . . no hard carbon . . . freedom from stuck rings . . . economical operation, that's what Sun Oil Engineers — those Doctors of Industry — are proving can be achieved. These skilled technical men are ready, willing and able to help you step-up the operating efficiency of your diesels and the products they have to offer have been developed to maintain that improved efficiency. For proof of what Sun Service can accomplish write for "Helping Industry Help America."

SUN OIL COMPANY • Philadelphia

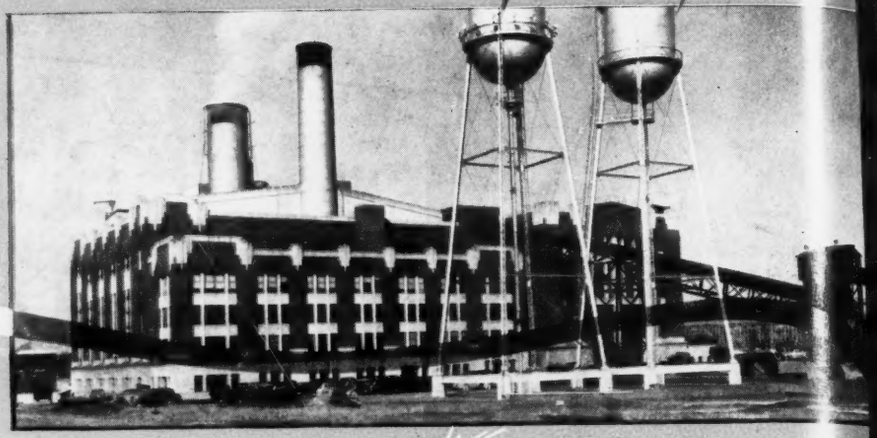
Sponsors of the Sunoco News Voice of the Air — Lowell Thomas

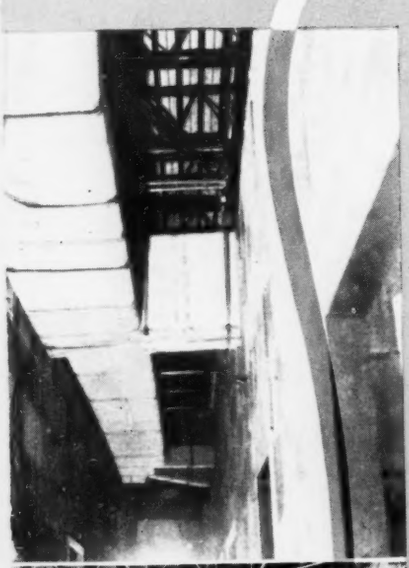
SUNOCO

SUN PETROLEUM PRODUCTS.. HELPING INDUSTRY HELP AMERICA

Carey PRODUCTS

ASPHALT
ASBESTOS
MAGNESIA





Mobilized for VICTORY!

Guns, Planes, Tanks, Ships—these are the machines of war that reach the fighting front. Yet they are but a small part of America mobilized for war.

Back of these fighting forces are the nation's stupendous industrial resources—the thousands of plants that fabricate the materials for industrial construction and provide housing for our millions of war workers—that produce the Steel, Aluminum, Power, 100-Octane Gasoline, and countless other products vital to the war effort. In this group is CAREY—a large part of its production now going into construction related to the job of winning the war.

CAREY PRODUCTS are saving thousands of tons of steel. . . . Conserving Fuel, Power and Transportation. . . . Aiding production of Aviation Gasoline and Synthetic Rubber. . . . Contributing to the efficiency of man-power and machine-power . . . Supplying essential materials for industrial construction and war housing.

On these and a hundred other fronts, CAREY Products are performing services that are war essentials, such as the invaluable services of Carey Rock Wool Insulation in conserving fuel in the homes and commercial buildings of the nation; while many other Carey Products are meeting city and farm civilian needs for repairs and maintenance—vital factors also in America's Mobilization for Victory.

THE PHILIP CAREY MANUFACTURING COMPANY

Dependable Products since 1873

Lockland, Cincinnati, Ohio

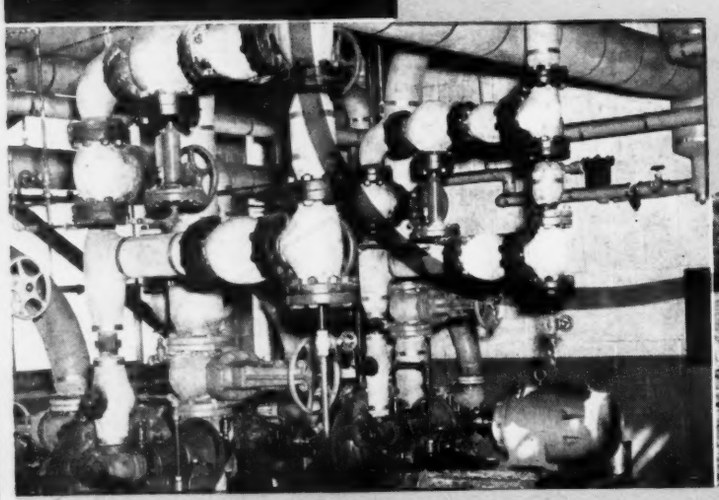
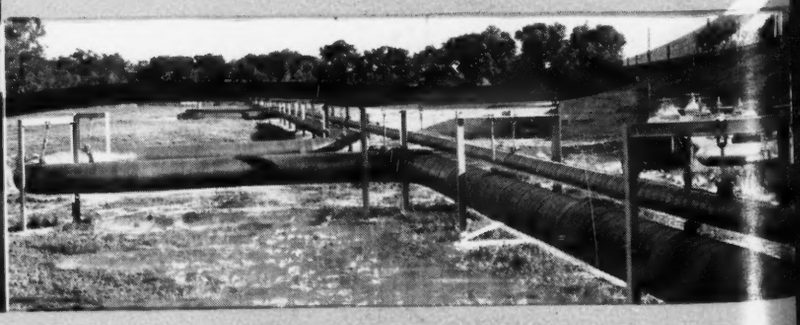
In Canada: The Philip Carey Company, Ltd. Office and Factory: Lennoxville, P. Q.

Illustrations—from top down

Power Plant operating with boiler and turbine pressure of 2500 lbs. at 940° F.—Carey Heat Insulations used.

Careyduct (all asbestos) used in air-conditioning system of public utility power plant.

Elastite Asphalt Flooring in power plant of large metal producer.

Carey Heat Insulations in power plant at army air field.

Long overground run of steam lines from power plant—Carey pipe covering.